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The THERAPEUTIC GAZETTE

INCORPORATING

MEDICINE AND THE MEDICAL AGE

A Monthly Journal of

Practical Therapeutics

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ORIGINAL COMMUNICATIONS.

SOME PAINFUL CONDITIONS DUE TO COLD: NEW MODES OF RELIEF.[1]

BY A. B. HIRSH, M.D., PHILADELPHIA.

Such indifferent results usually follow the accepted treatment of certain results of exposure to extreme cold that any recognized method offering improvement should be welcomed. These accidents, even if classed among the less serious afflictions, may so interfere with daily duties as to call for the best efforts of the practitioner. Pain in either extremity may be continuous from this cause in frigid weather; if less obvious to the phlegmatic patient it none the less is often accentuated to the point of physical torment for the individual of nervous type. It may otherwise vary in degree, dependent upon the severity of the original or subsequent exposures. Extreme cases mainly are those that call for relief by the physician, milder attacks being as a rule borne in silence, untreated.

PAIN IN THE LIMBS.

First may be considered an instance of cold extremities, functional, in one of sedentary habit: An otherwise healthy matron of thirty-nine years had nursed her husband through a protracted acute illness, and then, to meet the financial strain, spent a trying winter season behind the counter in a department store. Neurasthenia, now of four years' standing, resulted, the chief trouble in winter-time (due largely to insufficient exercise) being marked aching sensations in all extremities. There could be no question as to her suffering so far as objective evidence existed of cold arms and legs; these were almost icy cold at times, even though heavy woolens were worn. Blood-pressure, either arm, sitting, was 155 mm., systolic; 100 mm., diastolic; pulse-rate, 72. The blood-pressure and pulse-rate, lying, were equal but lower on either arm; therefore, physical exploration showing all organs to be in normal position, the more especially "splanchnic" variety of neurasthenia could be excluded. It was evident that the slight hypertension present, possibly also the actual continuation of the neurotic state, depended on long-time marked pyorrhea alveolaris and infected tonsils. Urinalysis proved negative.

It is unnecessary here to go into the great variety of remedies, medicinal and mechanical, massage, and the older kinds of electricity among them, that had been fruitlessly employed; that is the familiar tale with most cases of neurasthenia. Indications called, of course, for removal of the pyorrhea and tonsillar disease, but, aside from this detail, treatment was directed to such systematized passive muscular exercise as would make up for the patient's own psychic inability to bring about normal tissue change. Autocondensation was first given from the coil transformer, the patient lying on a three-inch-thick cushion that rested on a five-foot-long metal electrode, the hands placed on a brass bar that formed the other electrode. This aimed at (1) lowering of the hypertension to remove

[1] Read before the Philadelphia Clinical Association, December 18, 1916.

nervous irritation from that source, and (2) thorough heating of the extremities by passage through them and the trunk of a small quantity of alternating current (half an ampere) at a pressure of 10,000 volts and an oscillatory rate of one to two millions per second. There then followed an application of the so-called "wave" current from the static machine for improved general nutrition through vigorous action on the upper intra-abdominal organs, these lying beneath the active electrode, and for coincident uniform passive muscle fiber contractions over the entire body.

Quite naturally, her delay in repair of the gums, teeth, and tonsils, with reinfection from these foci, means an occasional return of her attacks, but relief of the cold limbs and sharp pains is assured. She comes for a few days' treatment at infrequent intervals and seems to be fully satisfied with the comfort thus obtained.

Sure removal of severe aches in the limbs, hands, and feet, due to simply sedentary living, when exposed to inclement weather, as a rule can be promised these sufferers, and not a few confrères are among those so treated.

Cold Extremities from Arteriosclerosis.—Quite another picture is seen when the agonizing pain of such cold limbs depends on markedly sclerosed arteries, and our best efforts can but slightly influence the thickening in the walls of vessels whose lumen is correspondingly narrowed. Even here, though, having in mind the studies of MacCadrick,[1] benefit has followed long courses of autocondensation in some advanced cases. One of these patients, in particular, an old soldier of seventy-three years, unable any longer to walk from this cause, had to be brought to the office in a roller chair for his first visits. Vascular sclerosis was marked, causing abdominal crises, irregular head pains with vertigo, and, at times, mental depression. The blood-pressure, either side, sitting, was 220 mm. systolic, and 140 mm. diastolic; under treatment the ultimate lowest points reached were 180 mm. systolic, and 120 mm. diastolic. What caused him greatest distress, though, was the aching in his lower limbs usually present in the winter season, pains so aggravated that neither warm clothing nor artificial heat afforded any benefit; indeed, friction in any form only increased his suffering. Here, aside from advising a more concentrated diet, lessening his excessive use of tobacco, and ordering an occasional mild laxative, the main dependence was placed upon (1) daily séance of radiant light and heat by a 500-candlepower hooded incandescent lamp for its improved arterial blood supply; and (2) on autocondensation, repeated on alternate days for months, for the hypertension and to possibly remove some of the more soluble deposit in the vessel walls. The man was able to dispense with the roller chair after the first week, and finally there was relative improvement in all symptoms. What was most gratifying was the practical vanishing of his severe leg and foot pains so that so far in the present season he has not found it necessary to resume the visits to the office.

[1] Rigidity of Calcified Arteries, *British Medical Journal*, October 18, 1913.

CHILBLAIN.

Pernio or frost-bite is one of the minor painful results of exposure to low temperature in winter-time, although instances of this accident are not unknown among workers in refrigerating plants at any season of the year. The medical practitioner, though, is only too infrequently consulted for relief of the ache, burning, and itching from this cause, the laity assuming that treatment is of but little or no avail, older treatment methods not preventing annual return of these annoying symptoms.

Let us first have an exact knowledge of the origin and course of the condition: The clearest summary of its development and pathology is given by Arthur Whitfield,[2] who finds it most frequent in those in whom exposure to cold induces arterial spasm in fingers and toes, one or more. The term "dead finger" expresses this thought, although such a degree of localized anemia

[2] Skin Diseases and Their Treatment, London, Edward Arnold, 1907, pp. 106-7.

need not necessarily be present. Its development may be circumscribed or diffuse. If circumscribed a deep nodule forms quickly in the corium, causing an edematous patch as large as a split pea, of pale pink color, and with a stretched and shiny condition of the epidermis over it. This nodule gives rise to extreme itching, burning, or tenderness. In most cases the nodule subsides, but one or two further developments may occur. First, the epidermis may be raised as a whole in a thick-walled vesicle which ruptures, leaving a small indolent ulcer, and this may either become infected and spread or may slowly heal with or without the production of a visible scar. Secondly, while not producing so severe a disturbance of the epidermis as to raise it off the papillary body, there may occur a hypertrophy with abnormal formation of the horny layer, resulting in a fissure with thickened edges. The diffuse form is perhaps not properly to be called chilblain, but it is so common an accompaniment of marked chilblain that I class it with these lesions. It occurs as a diffuse edema of part or the whole of a digit, either finger or toe. Vesical formation does not occur, but improper and horny development is the rule, producing roughness, scaling, and fissuring, and lasting long after the cessation of the cold weather, in some cases even producing permanent deformity of the part.

Pathology.—The processes at work . . . there is evidence of (1) an irritability of the nervous system; (2) a special vulnerability of the vessel wall; and (3) in most, if not in all cases, a retardation of the coagulability of the blood . . . hyaline thrombosis has been described as a characteristic feature.

Oliver S. Ormsby[3] states that chilblains may be the start of various other lesions or affections, due to lowered vitality from vascular defects. He adds by way of diagnosis that redness vanishes under pressure. While feeling more or less warm, the part is actually cool or cold to the touch; it may even be moist with sweat.

[3]Diseases of the Skin, Philadelphia, Lea & Febiger, 1915.

Whitfield (*loc. cit.*, p. 108) correctly advises basing treatment on these pathologic factors, but his remedies are typical of older ideas that must give place to more effective physical means. He would first reduce the tendency to arterial spasm by minute doses of opiates or by such vasodilators as glonoin, grain 1/200, *ter in die*, or erythrol tetranitrate, 1/50 grain, thrice daily. Instead of these he may apply the continuous current, five milliamperes for ten minutes daily for a short or long period, the negative pole on the nape of the neck and the positive in a wash-bowl of warm water for the hand, or a foot-bath of the same for the foot. He condemns woolen gloves, substituting fur or wool-lined leather ones.

Under the newer methods, when a patient is seen during the stage of acute pain, just after receipt of injury, the tissues are usually so exquisitely sensitive that our efforts for relief are limited to (1) radiant light and heat from a 100-candlepower incandescent hooded lamp, swung for about half an hour over the affected area; this to be followed, if the pain abates but little, by (2) the hooded cobalt blue incandescent bulb; finally, by the brush discharge (effleuve) from the static machine. When not seen, though, until the subacute or chronic stage is reached, then resort may be had at once to the latter modality, a twenty-minute séance of the brush discharge sufficing (perhaps with some daily repetitions) to contract the relaxed vessels underlying the symptoms complained of. This plan will as a rule succeed, although small resisting areas may need the mild wave current or even fine indirect sparks from the static machine. Because of the thin layer of soft structures between skin and bone, the static brush discharge is always the modality of choice when the ears, scalp, or forehead have been thus frost-bitten. Just the opposite holds true when the face below the eyes has been so badly chilled as to require attention, whether the trigeminus or the facial nerve distribution be the seat of severe pain or of muscle

paresis. Here we deal with an actual neuritis, with a congestion, effusion, or exudate about the particular nerve involved, and then the static wave current, by squeezing out this abnormal deposit, proves itself a practical specific. Radiant light and heat, ionization with a one-per-cent sodium salicylate solution, either or both, help to remove the pain factor in certain cases.

Fissured lip, finger, or toe (rhagades) calls for the static effleuve, the thickened horny margins melting down and the tender exposed corium firmly cicatrizing. No sequel is more satisfactorily treated.

PAIN FROM NASAL SINUS OBSTRUCTION.

Blocking of the intranasal orifice of one or more of the nasal accessory sinuses, oftenest due to acute coryza (more frequent during wintry weather), may cause more or less marked pain, either from the vacuum created by congestion in the sinus or from actual suppuration or both. Incidentally two cases of extension of the acute condition with fatal meningitis, occurring within the past few months, are known to the writer, suggesting that prompt removal of the mucous congestion calls for better methods than have hitherto been in vogue. The profession, for instance, now realizes that intranasal deformity, as a cause of local congestion, must first be corrected as a means of prevention. When consulted for acute sinus pain, dependent upon other causes, five new measures are now at command of the practitioner: (1) It is usually possible to lessen the acute mucous membrane swelling by acting on the nasal vasomotor nerves through a five-minute manipulation of the intervertebral space below the seventh cervical vertebra. This simple maneuver, first advocated by Abrams of Stanford University,[4] may be digital or carried out by a plexor and pleximeter, the vibrator, the concussor, or the rapid sinusoidal galvanic current. (2) At times directing the rays of the cobalt blue hooded incandescent bulb into the nasal cavities will ease both congestion and accompanying pain.[5] (3) For *frontal* sinus involvement the patient lies face upward, and eyes protected by thick pads of moist cotton; the rays of a 500-candlepower hooded carbon filament lamp are directed over the face, and especially the forehead, for fully one hour.[6] (4) Acute sinus involvement, other than frontal, may be removed by the Oudin or Tesla current, from the coil transformer, applied through the usual glass vacuum nasal electrode. This has at times been alternated with the static wave current through the same electrode, in which case the spark-gap should not exceed half an inch to avoid irritation locally.[7] (5) In a few cases success in reducing the intranasal congestion has followed resort to the static effleuve, directed by the de Kraft "blue pencil" electrode into the obstructed nostril.

Conclusions to be drawn are:

Aching chilled extremities, the cause of actual distress, may be fully relieved by autocondensation followed by the static wave current. Removal of infective foci or other remote factors is essential for permanence of this relief.

Chilblains, according to degree and part of body involved, require (1) radiant light and heat, (2) the cobalt blue hooded bulb, and (3) the static effleuve. Where neuritis or muscle spasm coexists the static wave current and static indirect sparks are added.

Sinus pain, from intranasal congestion, usually vanishes after resort to one or more of these modalities: (1) Manipulation of the posterior nerve division below the seventh cervical vertebra; (2) use of the cobalt blue incandescent hooded bulb; (3) radiant light and heat over the frontal area; (4) the Oudin or Tesla current through intranasal glass vacuum electrode; (5) the static effleuve by the same electrode.

[4]Albert Abrams, Spondylotherapy, fifth edition, San Francisco, Cal., Philcpolis Press, 1915.

[5]Report of Committee on Phototherapy, American Electro-Therapeutic Association, 1912.

[6]W. B. Snow, *Journal of Advanced Therapeutics*, Dec., 1914. p. 496.

[7]Frederick Tice, *ibid.*, June, 1913, p. 224.

INCREASING REFRACTION FOLLOWING INCREASED TENSION OF THE GLOBE.[1]

BY S. D. RISLEY, M.D.,
Surgeon to the Wills Eye Hospital, Philadelphia.

My early studies on the genesis of the myopic eye suggested the opinion that increased tension of the eyeball consequent upon the congestion of the uveal tract, due to eye-strain in the presence of errors of refraction and abnormalities of binocular balance, was the determining factor in the distention of the globe. At that time a considerable group of cases were published, in each of which the increase of refraction from hypermetropic to myopic through the turnstile of astigmatism had occurred while under observation, and were associated with advancing pathological change in the uveal tract, the observed changes being characteristic of the myopic eye.

I have had the opportunity several times to witness the change from hypermetropic refraction to myopic after recurring attacks of iritis associated with severe involvement of the entire uveal tract. In each case attachments of the iris to the lens capsule had been avoided by treatment, and no permanent impairment of the nutrition of the lens had supervened. These examples are of interest in this study from the fact that they all occurred in adults; in one at approximately fifty years of age—that is to say, at a time of life when the sclera are normally more rigid and unyielding than the relatively tender and yielding sclera of childhood. I now have to report a case of hypermetropic refraction, with high glaucomatous tension, which passed while under treatment into myopia, *pari passu* with complete disappearance of the increased tension and pain.

Miss X., spinster, aged seventy-one, a small, frail woman, came under observation December 2, 1914, with a mild type of arthritis deformans and cardiovascular disease. She had suffered increasing dimness of vision for two years in the right eye, but failure in the left was recent. She was wearing over the right —2.00 ○ —.50 cyl. axis 75°, V=6/XX; for the left + .50 cyl. ax. 90°, V= 6/X. These glasses had been prescribed two weeks before, but she had worn before receiving them convex glasses:

1891—R. + 1. c. ax. 90° | Add + 1.62 for near,
L. + 1. c. ax. 90° |

1900—R. + 1.75
L. + .75 ○ + 1. c. ax. 90° | Add+2.50,

which had been worn for many years for distance with stronger reading glasses.

O. D. The cornea was steamy, anterior chamber shallow, marked ciliary injection, field of vision contracted to nearly the fixation point, pupil dilated medium, T=50 mm. The electric ophthalmoscope showed dimly a deep characteristic cupping of the disc. She was using eserine solution of unknown strength, but the pupil did not react to the drug.

O. S. Much the same general conditions were present, but the field was wider and central vision 6/X with difficulty and showing tendency to fail. T= 35 mm., and the pupil reacted to the eserine.

She had arthritis deformans of a somewhat mild type, but suffered frequent painful, acute exacerbations, at which times her eyes were more painful and her vision still further impaired. There was *arcus senilis* in both corneæ. The veins in the fundus were large, dark, and tortuous; no white lines could be made out along the border of the arteries, but there was a general veiling of all details by a general edema of the fundus. The blood-pressure was 180 mm. in systole, diastolic 95 mm., the pressure showing a tendency to rise while under examination, and the pulse was accelerated.

Dr. David Riesman reported as follows: "Some enlargement of the heart to the left, with decided accentuation of the second aortic sound. Summing up I would say that Miss X. has hypertension, probably dependent upon arteriosclerosis, and associated with mild changes in the kidney of the nature of chronic interstitial nephritis."

Her general regimen was carefully regulated, and she was placed upon alkaline treatment with bichloride of mercury 1/100

[1]Read before Ophthalmic Section, College of Physicians, Philadelphia, Nov. 16, 1916.

gr. and daily doses of magnesium sulphate internally. Locally the eyes were subjected to frequent soaking or laving with an alkaline wash, and frequent, systematic instillations of a weak solution of eserinæ salicylat.

On December 12 vision had risen with her glasses to 6/XII with the right eye, 6/VII-½ with the left, and on the 17th to 6/IX and 6/VI respectively. Her pain was gone, the corneæ were clear, and the edema of the fundus had disappeared. The general condition had improved, B.P.=160°. The field of vision in the left eye was wider, but had not changed in the right. Pupils had both reacted to the eserine. To palpation the tension of both seemed markedly lower; the tonometer showed approximately 28 mm.

The treatment was continued, and no serious exacerbation occurred until April 9, 1915, when she came with eyes injected, marked photophobia and some pain, with increased impairment of general health. The pupils were contracted to pin-head size, but nevertheless the tension had risen to 47 mm. and 32 mm. respectively. She was evidently on the verge of an acute inflammatory attack. After a morning in the office with repeated alkaline stupes and instillations of eserine the attack subsided. Iridectomy was suggested as a probable necessity, but declined.

The history of the following months is an interesting one, noting several exacerbations and a growing mental despondency, but the central vision was maintained and no notable changes in the fields of vision until August 27, 1915. She then suffered a severe return of redness and pain with reduced vision, which again subsided while in the office under repeated alkaline laving and instillations of eserine. The following day, August 28, she returned with injection and pain gone. V= 6/XII O. D., 6/IX O. S., T= O. D. 20 mm., O. S. 30 mm., B. P. 115° in systole. Her physician a few days later reported that Miss X. was very feeble, had many exhausting trials and embarrassments to endure at home. She was then admitted to the Media Hospital for care and treatment. The general condition again improved, but the central vision steadily failed, and she had difficulty in moving about alone after her discharge from the hospital. Discomfort with the eyes had disappeared, and there were slight variations in the tension but none in the field of vision until May 4, 1916. She was then free from pain and the balls were both soft. T= 15 mm. O. D., 20 mm. in O. S., O. D. V = 6/XXV, with —4. V = 6/XV, O. S. —1.50 ○ —.50 cyl. axis 180°, 6/X.

Since that date, May 4, 1916, there has been no recurrence of increased tension or pain. The anterior ciliary vessels have remained engorged, the anterior chamber of normal depth, and her general health somewhat better. The central vision O. D. —4. D. 6/XV +, O. S. —1.50 ○ —.50 cyl. axis 180°, 6/X.

With one slight exacerbation early in September, associated with an attack of rheumatism in the shoulder, the eyes have remained fairly comfortable, and on September 22 she received for constant wear O. D. —3.50 ○ —.50 cyl. axis 90°, V = 6/XV, O. S. — .1.75 ○ — .50 cyl. axis 180°, V = 6/IX + 4. added as bifocal, T = 15 mm. and 20 mm. respectively.

This history awakens inquiry as to its explanation. Was the increasing refraction to be explained by changes in the crystalline lens? This is not a very unusual occurrence, but swelling or sagging back of the lens would not explain the disappearance of the, at times, almost stony-hard eyeball; nor would the swelling and increased opalescence of the lens be compatible with the maintenance of the central acuity of vision or of the fairly normal depth of the anterior chamber. A careful study of the balls revealed an obvious, quite uniform thinning of the sclera in the anterior segment of the ball, and just back of the scleral ring a groove encircling the cornea could be demonstrated, as though drawn inward possibly by a drag inward or backward through shrinking or atrophy of the ciliary body. It is to be presumed, therefore, that an actual increase in the anteroposterior axis of the globe had taken place in response to the prolonged intraocular tension.

"THE CURE" AT THE BEDFORD SPRINGS OF PENNSYLVANIA.

BY HENRY B. INGLE, M.D., PHILADELPHIA.

The European war has compelled us to learn to do without many of the things which we had grown to consider essential and to develop our own resources to compensate for them. The many European spas and health resorts so much patronized in the past by Americans are now inaccessible, and for years after the war will be undesirable. What have we in this country to take their places with no detriment to our patients? A detailed report of the mineral springs of this country has been made by the U. S. Department of Agriculture and shows their number to be almost legion, so that an analysis of the entire field is superfluous as well as out of the question in a paper of this length.

My purpose in writing this brief paper is to call the attention of physicians to a spring which loses nothing in chemical and therapeutic value by comparison with the best of European springs, and which may be used to efficiently replace the European spas of which we are deprived.

Gordon's Gazette of the State of Pennsylvania says: "In the year 1804 a mechanic of Bedford, when fishing for trout in a stream near the principal fountain, was attracted by the beauty and singularity of the waters flowing from the bank and drank freely of them. They proved purgative and sudorific. He had suffered many years from rheumatic pains and formidable ulcers of the legs. On the ensuing night he was more free from pain and slept more tranquilly than usual; and this unexpected relief induced him to drink daily of the waters and to bathe his limbs in the fountain. In a few weeks he was entirely cured. The happy effect which they had on this patient led others, laboring under various chronic diseases, to the spring. In the summer of 1805 many valetudinarians came in carriages and encamped in the valley to seek from the munificent hand of nature their lost health."

Dr. Caspar Morris of Philadelphia, in the *Medical Examiner*, wrote of Bedford Springs: "Within a very small area are to be found one spring of pure slate water, another impregnated with hydro-sulphuric acid, a very copious spring of mountain limestone water, and that which gives special value to the spot, the Mineral Spring."

The first analysis of the Bedford Mineral Springs was made by Dr. Church of Pittsburgh, in 1825, who gave the result to the public through the medium of a communication to the Pittsburgh Medical Society.

The therapeutic use of Bedford Springs is therefore, as judged by our American standards, historic. Indeed, the waters were more appreciated by our forebears than by us, and for a century have been patronized by the most conservative and scientific physicians of the south and east. A perusal of the old registry books reveals names of historic interest. President Buchanan and many of his cabinet and foreign diplomats were taking the "cure" at Bedford Springs when Queen Victoria's greeting was sent over the first Atlantic cable, the message being relayed to him there.

Indeed there is a glamour of the old south that still clings about the older buildings and adds its charms to the many natural and artificial beauties of the Spring. It is a peculiar fact that Bedford is and was more appreciated by Southern people than Northerners, and the effect has been to give an intangible charm to the place which is unique.

The Springs are located in a beautiful valley in the eastern range of the Alleghany mountains—contiguous with the Cumberland valley in the southwestern part of the State. The Lincoln Highway runs through Bedford, thus making an auto trip to the Springs a real pleasure trip. The hotel itself, adjacent to the Springs, is an excellent collection of five buildings of southern colonial architecture, with white-pillared porticos and porches on all floors. It extends parallel to the road in a beautiful grove of old trees with a well-kept lawn.

In back of the hotel is Constitution Hill, with a copious spring of absolutely pure water at its base—the "sweet spring." In the hotel grounds, but 100 yards distant from the hotel, is the Sulphur Spring, a calcic-sulphated-alkaline-saline spring, very highly mineralized, which gives off hydrogen sulphide gas very freely and is entirely free from organic contamination.

Across the narrow valley and reached by a long colonnade from the hotel is the Mineral Spring, of highly mineralized calcic-sulphated-saline water, containing 2705 mg. per liter of minerals. The principal salts are calcium sulphate, magnesia sulphate, and calcium bicarbonate.

A beautiful nine-hole golf course extends up the valley, and, with tennis courts, horseback riding, a modern-tiled swimming pool, and beautiful mountain walks, offers varied forms of amusement and exercise to the guests.

Just outside the reservation of Bedford Springs is the town of Bedford, where many smaller hotels and boarding-houses offer lesser accommodations when desired. The season at present is from early June to the middle of September, and the time for the cure is 21 days.

Arriving at the Springs after a short drive from Bedford, we discover that the office force and many of the employees are the same as at the Royal Poinciana at Palm Beach, Fla., in the winter, thus insuring most efficient service. Intimating that it is desired to take the cure one is escorted to the doctor's office, where a full medical record is made, blood-pressure, urine analysis, and blood count taken, and the diet and regimen are advised.

The class of cases for which Bedford Springs are peculiarly effectual are gout, diabetes, liver disease and gall-stones, rheumatism, intestinal toxemias, and obesity; and secondarily, nephritis. The most satisfactory cases are the gouty ones; the effect of the waters is so remarkable in these cases as to be unaccountable by the chemical analysis alone. I have seen cases treated by the best physicians yield in two or three days to the waters alone. In diabetes, diet and the use of the magnesia springs is the most efficient plan. I consider the action of the water on the liver as one of its principal effects, not only as a laxative but as a real cleanser.

A suitable mineral water just a little hypotonic to the blood is rapidly eliminated, carrying with its excretion the toxins and waste products found in the blood and tissues; and of course the portal circulation first feels this cleansing force. This to my mind answers the argument so often heard that "any water will do as much if taken freely." Unlike some of the mineral waters now advertised, Bedford water is not taken in large quantities; five or six glasses daily is an average maximum dosage, and larger doses do real harm.

The usual routine, which is varied for different diseases and individual peculiarities, is to give one or two grains of calomel in divided doses the night before beginning the "cure." The patient is instructed to arise at 7 or 7.30 A.M., at which time a beautiful bugle call is sounded from the portico. The patient, if ambulant, dresses and walks to the mineral spring and drinks slowly one or two glasses of the water, with an interval of fifteen minutes between glasses, exercising the while by walking up the various pretty mountain paths which are recommended so that the gradient suits the individual strength. One-half hour later he returns to his room, bathes, and dresses, or goes directly, if his exercise is less strenuous, to the breakfast table. At this meal no fresh or acid fruits can be taken, but stewed fruits are considered a part of the regular diet. Rest is advised for one-half to one hour after eating, and in the forenoon two to four glasses of water are again taken, with intervals of fifteen to thirty minutes, accompanied by exercise, advised for the individual case. If active exercise is impossible massage and restricted movements are advised, and baths, packs, sprays, etc., used to meet individual requirements.

The reputation of the cure at Bedford has been attained almost solely from the potency of the waters themselves; for the

various hydrotherapeutic adjuncts, mechanical apparatus, electricity, etc., have been but little utilized.

The sulphur spring has been used but little, and only in the past two years has it received any of the attention it merits. It has, however, a well-established reputation among the older habitués of the Spring as a soporific, and I would like to have explained to me why water of its character which gives off freely hydrogen sulphide gas should act as a somnifacient. That it does so I know from varied experience. Whether it is the cause or the effect of Bedford's more extensive favor in the South, I find that many of the leading physicians of Baltimore refer cases to the Bedford cure, while in Philadelphia it is used by only a few of our best men.

Its location, its undoubted merit, and the unassailable fact that it offers as much medically and socially as any other American or European springs, should make its use by physicians more common, and add a valuable therapeutic weapon to our "Made in America" armament against disease.

A CLINIC AT THE JEFFERSON MEDICAL COLLEGE HOSPITAL.

BY H. A. HARE, M.D.,
Professor of Therapeutics and Diagnosis.

Before showing you the patient which I propose bringing into the amphitheater later in the hour I wish to speak of the case of typhoid fever which I showed you two weeks ago. I refer to the young Italian lad of about nineteen, who at that time, you will remember, had had a number of fairly copious intestinal hemorrhages. These hemorrhages continued. At about 12 o'clock at night a week ago he developed a marked tympanites, seemed to be somewhat restless, but didn't complain of any abdominal pain. There was no fixation of the abdominal muscles, nor was there any leucocytosis, which might, if it had been present, have aided us in determining that there was an intestinal perforation. As he had frequently had tympanites and been restless on previous occasions these symptoms had little or no value, and it was only when, on the next morning, we found a tendency to bulging in the right flank that we decided, without any very excellent grounds for our decision, that the symptoms pointed to perforation and that an operation should be performed. Possibly it was the swelling of the right flank and the increased pulse-rate which led us to this conclusion. Professor Stewart within twelve hours after the symptoms first appeared opened the abdomen and found a *perforation* about 4 inches above the ileocecal valve, which he closed. The patient stood the operation well, but soon after went into collapse and died within twelve hours. Let me impress upon you the fact that hemorrhage and perforation are responsible for what may be called the "irreducible mortality" of typhoid fever. Whereas thirty years ago the mortality frequently ran as high as 18 or 20 per cent, it is now often not above 7 per cent, and for this 7 per cent hemorrhage or perforation is almost entirely responsible. Until we discover some means by which the suffering from ulceration in the bowel can be modified, it would appear that this irreducible mortality must continue.

The second patient that I wish to speak about is a woman of fifty-six, who began to suffer from fever, nausea, and vomiting the middle of last August. I saw her in consultation the middle of September in Rhode Island, at which time, in the absence of certain examinations of the blood which seemed essential, I found it impossible to reach a diagnostic conclusion. A month ago, still very ill, still febrile, and still vomiting, she was brought to Philadelphia, where, when carefully examined, I found in the right upper quadrant a small area which was distinctly tender on deep pressure. I asked Professor Da Costa to see her with me in consultation, and he advised immediate operation, not being sure whether the

difficulty lay in the gall-bladder, in the pylorus, or in the small bowel. The operation revealed the presence of a single large cholesterin stone in the gall-bladder. This was removed and drainage instituted. The patient did remarkably well for the first ten days, the temperature dropped to normal, and the vomiting ceased. At the end of that time the vomiting returned, the temperature rose at night above 102°, and the condition was considered as alarming. A careful examination of the wound failed to reveal any cause for the fever. Pneumonia at the base of the lung and subphrenic abscess were considered and excluded. There was no leucocytosis. The urine was carefully examined to see if there was any infection of the pelves of the kidneys. Neither microscopic nor cultural methods revealed trouble. Finally, the bile itself was cultured, and a *pure culture of the typhoid bacillus* was obtained. At the end of ten days the temperature became normal, drainage having been made more free by the introduction of a larger tube, and the patient is proceeding in convalescence.

The question arises as to whether the typhoid bacilli in her gall-bladder were due to the fact that she became infected by this disease a short time before she fell ill with her abdominal symptoms so that the period of incubation complicated convalescence, or whether she is a typhoid carrier, having had typhoid bacilli in her biliary passages for many years. The patient denies typhoid fever in her history, but at one time she lived in a part of Pennsylvania where typhoid fever was very prevalent, and where it was also frequently diagnosed as malarial fever. As she had more than one period of severe ill health during her residence in that town, it is quite possible that one of her attacks of so-called malaria was due to typhoid infection.

The most important point for you to remember about this case is that it illustrates what I have so often insisted upon your remembering, namely, that because a patient has one condition that is no reason for ignoring the fact that she may have one or more other conditions. Too frequently a physician is content, having found one cause for illness, and fails to look for other causes. A man with pneumonia often has nephritis; a man with typhoid fever often has pneumonia. Here was an instance in which our minds being centered upon the surgical operation and the possibility of infection at the site of operaton, we, perhaps, did not at first take into consideration every possible, as well as the likely, complications which could be responsible for the post-operative state.

The third case I wish to speak of illustrates the fact that there is a difference between a *surgical recovery and a medical recovery*. This woman of forty-eight states that she began to suffer last February with a burning in the stomach associated with acidity. She entered one of the large hospitals and was advised to have her appendix taken out, and also to have her gall-bladder drained. These things were done, and she seemed a little better for a time. Within a month, however, she entered another hospital complaining of pretty much the same symptoms as before; here, again, she was operated upon, the gall-bladder being removed. As you see, she has two large scars, one below the other, in her abdominal wall. She now comes to us presenting all the symptoms of postoperative neurasthenia, a perfect host of aches and pains, burnings, formications, and what a darky would call "general misery," which make her life a burden, and doubtless make her husband's life a burden, and which certainly make my life a burden. She now has in place of her gastric acidity, which I presume was supposed to be gall-bladder trouble, all sorts of aches and pains in her abdomen, and the chances are that there are more organic causes for these aches and pains at present than there were before the operations, since the two openings have probably resulted in the formation of adhesions, and if a third operation is attempted to break up the adhesions, still another set will probably develop. This case, as I have said, represents the difference between a surgical recovery and a medical recovery. The patient has recovered from the effects

of the operation, but she has not recovered her good health, for which she was willing to be subjected to operation. She is far worse than before, and, instead of suffering from functional disorders, is now suffering from organic disorders as well as functional ones. When you get into practice you will frequently meet with cases of so-called operative recovery, which are undeniably such, but which do not bring to the patient the relief sought. One point is that where very definite, distinct, and urgent conditions demand operation it should be unhesitatingly performed, but the other point is that when you recommend that an operation should be done you must bear in mind that it isn't simply a question of recovery from the operation and perfect health, but recovery from the operation with a condition which, frequently, is worse than the first. This should not count when life is in danger, but is a large factor when health is sought.

The next patient is the man suffering a *pernicious anemia* that I showed you about six weeks ago. You will recall that, at that time, I stated that his blood presented every aspect which can be presented by the blood of a patient suffering from this disease, and that repeated examinations absolutely excluded any errors in diagnosis. You will also recall his intense pallor, the fact that he had taken little food and often vomited, and that he was so weak as to be unable to get out of bed. After trying Fowler's solution in ascending doses for a period of two weeks, which is too short a time to give it a fair trial, his condition seemed so desperate that we felt that another plan must be instituted, and we began giving him a grain of cacodylate of sodium every third day by hypodermic injection, with the result, as you see, he has got back what might be called his normal color, is able to walk into the amphitheater without difficulty, and now we have to urge him to remain in the hospital. His red blood cells, which at first numbered only 850,000 per cubic millimeter, now equal 2,160,000. I have never seen such rapid improvement take place in a case of pernicious anemia. It seems too good to be true, and I am in doubt how much to attribute the improvement to the cacodylate of sodium, and how much we should attribute it to the well-known fact that this disease is characterized very frequently by periods of remission, and even by periods of considerable improvement, but the degree of improvement is rarely, if ever, so marked as it is in this case.

The next patient is a little Italian girl that I showed you a week ago, in whom the diagnosis lay between *typhoid fever* and *miliary tuberculosis*. At that time you will recall that, while undecided, I was in favor of the latter diagnosis, but since then her temperature has become normal, her appetite has improved, her tongue has cleaned off, and she presents the aspect of a patient convalescing from typhoid fever rather than that of a patient progressively ill because of miliary tuberculosis, and this in spite of the fact that she has given us two very markedly positive von Pirquet reactions; the Widal reaction has not been obtained at any time, and her blood cultures are negative. As I have already said to-day in regard to another case, the mere fact that she gives a positive reaction to tuberculin does not prove that the present illness is due to tuberculosis, since she may have healed tuberculous lesions in her body—that is, latent tuberculous processes which have no direct relationship to her present condition. In other words, here is another case illustrative of the fact that because a patient has one disease there is no reason for believing that she has not another. You will recall that the physical signs in her chest, while her fever was present, were rather excessive for the bronchitis of typhoid and much more like those of miliary tuberculosis.

Last of all, I wish to call your attention to several points in connection with this case of *croupous pneumonia*, occurring in a young man of about twenty-three, whose sputum is, as you see, quite typical of that disease. It is not my intention to give a clinic on the whole subject of pneumonia. I only wish to impress upon you these points: First, not to mistake the exaggerated breathing on the normal side for

sounds indicating disease on that side; second, that failure to find the ordinary bronchial breathing or to find the subcrepitant râles does not justify you in excluding pneumonia, for where there is severe consolidation these sounds may not be present. In other words, the absence of normal physical signs may be quite as indicative of disease as the presence of the abnormal ones which you naturally expect substituted for the normal sounds.

As to treatment, let me implore you, before administering any remedies, to exercise the greatest care in determining that the patient really needs medicinal treatment. You are not to treat the pneumonia, you are to treat the patient. You cannot stop the pneumonia or hurry it to its end. Nature helps the patient best in a large number of cases. If the first sound is distant and weak and the pulmonary second sound indicates some engorgement of the right side of the heart, one, two, or three full doses of digitalis will often do great good. If there is evidence of venous turgescence and the patient is full-blooded, plethoric, it may be wise in some cases to resort to bleeding. If pneumonia develops in a patient suffering from chronic interstitial nephritis, whom you know has had, for many months, a very high blood-pressure and a tired heart, it may, in certain instances, be wise to administer not only digitalis, for the purpose of supporting the heart, but moderate and carefully watched doses of the nitrites to lower the pressure slightly, thereby relieving the heart of some of its burden. As, however, a low pressure is usually considered an evil omen, if it develops in the course of pneumonia, care should be taken that great relaxation of the blood-vessels is not induced, and if the pulse speeds instead of being slowed by the digitalis so that it becomes nearly as rapid in number of beats per minute as the systolic pressure is represented in numbers of millimeters of mercury, nitroglycerin or other nitrites should be stopped at once, and, in many instances, it may be wise to use belladonna or atropine to raise the pressure and to establish circulatory equilibrium.

SUBLINGUAL MEDICATION.

In the *Practitioner* for October, 1916, PAULSON says that this method of administering medicine has not received from practitioners the attention it deserves. Since he first devised it, now some thirty years ago, he has used it in his own practice constantly, and invariably with success. Look in the nearest mirror, at the sublingual space. Note the thin membrane, the considerable area, and the large veins, denoting a free flow and return of blood. The space is always smooth, never furred like the tongue, never shielded by mucus, as the stomach always is when in active rebellion, or, maybe, masked by half-digested food.

For the absorption of concentrated remedies (unchanged and uncontaminated) directly into the circulation, he regards the sublingual space as the most reliable surface in the whole body. The only preparation necessary is rinsing with water, if the mouth is dry. A morphia and atropia disc, powdered with the point of a penknife, on paper creased in the center, and dropped just behind the teeth, the tongue being restored to its normal position, will be absorbed in a few seconds. The full effects of the dose may be absolutely depended upon, almost immediately.

Colliery and quarry practice often provide surgeons with casualties, not unlike those in military work; in both a morphia and atropia tablet relieves pain and shock as nothing else will. Paulson knows that they were extensively used during the South African war, and have found their way into ordinary practice, entirely on their own merits. Their adoption by the services would, he is certain, be of inestimable benefit. An apomorphia disc, administered in the way indicated, will induce vomiting at once. Compared with hypodermic injection, the sublingual method is quicker, easier, safer, cleaner, and more reliable.

Who has not, in an emergency, been annoyed by the cleaning of the spoon, dissolving the tablet, freeing and fixing the needle, drawing in the solution, cleansing the skin, and then the injection, generally into fatty and feebly absorbent positions?

EDITORIAL.

FRESH AIR IN THE TREATMENT OF PNEUMONIA.

Readers of the THERAPEUTIC GAZETTE will recall that we have called attention on more than one occasion to the value of outdoor air in the treatment of croupous pneumonia, and have expressed our belief that the institution of the outdoor treatment for these cases by Northrup marked a distinct advance in the treatment of a disease which has never done much credit to the medical profession. During the past year we published an article by Dr. Northrup supporting his views. There has also appeared a contribution which would seem to indicate that scientifically obtained records as to the pulse, respiration and blood-pressure fail to support the clinical observation that this method of treatment is markedly advantageous.

In the *American Journal of Diseases of Children* for November, 1916, Morse and Hassman, of Boston, point out that, largely because of Northrup's work ten years ago, a large number of clinicians have been treating pneumonia, both in adults and in children, by the outdoor method. They have attempted to carry out careful investigation as to the influence of being out-of-doors upon 32 children who were suffering from pneumonia, making in all 387 observations. The children varied in age between two and ten years, and eight of them died. The illness was classified as very severe in three; severe in fourteen; moderately severe in four; and mild in three. Although the mortality rate in this particular series was slightly above the average it has no significance, as rates based upon a small number of cases possess little value in a disease which varies so greatly in virulence and in the susceptibility of the individual.

On looking over this contribution it would seem to us that one important factor has not been adequately considered. The term pneumonia is a very elastic one, but is generally employed to signify croupous pneumonia or catarrhal pneumonia. Now, croupous, or lobar, pneumonia in children is a disease which rarely produces a fatal result, except as to sequela, notably empyema. On the other hand, catarrhal, or lobular, pneumonia is one of the chief causes of death amongst young children because of its frequency and its high mortality rate. Furthermore, it is important in a research of this kind to have information as to whether the illness is primary or secondary, since catarrhal pneumonia complicating or following measles or some other infection is quite a different malady from a primary attack.

The research quoted consisted not in studying two series of cases occurring simultaneously, one series being treated indoors, another outdoors, but by changing the treatment, the children being put out-of-doors for a varying number of hours, brought back into the ward again, put out again, and so on. It does not seem to us that this is a fair method of testing a plan, although it may be the proper method for determining whether being outdoors for a given period produces any changes temporarily in vital function. So far as the general course of the disease is concerned it might be compared to treating a series of cases of typhoid fever by the use of the Brand bath twelve hours out of the twenty-four and the administration of one of the antipyretic drugs during the other twelve hours out of the twenty-four. However, observations made by clinicians who are as careful and who have the reputation of these two authors deserve our careful consideration, the more so as conclusions which they draw are evidently not biased. They found that the blood-pressure, systolic and diastolic, was higher if the children had been in the warm air of the ward for some hours than if they had been out in the cold, but they add that the variations were, as a rule, so slight that they were within the limits of possible errors in observation. Again, they conclude that there is no definite relation between either systolic and diastolic pressure or the pulse pressure and

the severity of the disease, which we think is not remarkable in view of the fact that estimations of blood-pressure in children are never very satisfactory and always fail to give us information which can be compared to records obtained from adults. Morse and Hassman found, however, that the pulse-rate was lower out-of-doors than in the ward, as a rule, although occasionally the reverse was true.

Apropos of what we have already said about alternate methods of testing, their statement that the pulse-rate was usually lower when the patients had been out for twelve hours, or more, than when they had been out for a few hours, is important. They did not find that the temperature of the air had any constant effect on respiration, but they did find that the respirations were slower out-of-doors than in the wards, as a rule. It would seem that any method of treatment which saves the energy of the two vital functions of the heart and respiration is essentially advantageous, and this thought is emphasized by the statement of the authors that the impression of the house officers and nurses, who were constantly with the patients, was that in general the children were more comfortable out-of-doors than in the ward. They thought that they coughed less, were quieter, had a better color, and took their food better out-of-doors than when they were inside.

It would seem to us that no better tribute to the value of the outdoor method could be obtained than this, and we are therefore a little surprised that Morse and Hassman add to this statement that these observations "were merely their impressions and are, therefore, of little or no scientific value." The physician of experience well knows that impressions as to the general state of a patient are often much more valuable than isolated records obtained by instruments of precision. The authors admit that their study does not justify them in expressing any opinion as to the effect of the cold-air treatment on the mortaliy of pneumonia in children, but, in concluding their article, they express the view that the patients seemed more comfortable, and after all this is what we think is most desired by the active practitioner. Our great confidence in this plan is therefore unshaken.

BOILED MILK VERSUS RAW MILK IN INFANT FEEDING.

Even before the medical profession knew anything about bacteria the question as to whether boiled milk and raw milk had an identical nutritional value was actively discussed, and it was thought by every housewife that boiled milk was more constipating than raw milk. In the early eighties Randolph carried out a series of experiments upon adults in which he thought he proved very conclusively that boiled milk was not as digestible as raw milk, and since that time, with the improvements that have been made in studying digestion, a large number of other investigations have been carried out along somewhat similar lines with contradictory results. It has been increasingly evident that pasteurization has limited advantages. While it is true that pasteurization destroys, or inhibits, pathogenic organisms which the milk may contain at the time that it is subjected to moderate heat, it is also true that all the germs are not destroyed, and if the milk is kept, except under the most favorable conditions, for any length of time these organisms, which have been temporarily inhibited in their reproduction, multiply rapidly. Furthermore, it would appear that they multiply more rapidly in milk which has been pasteurized than they do in raw milk, the surrounding conditions being identical. The deduction from this is that boiled milk—that is, milk which has been subjected to a temperature sufficient to actually destroy germs—is in reality sterile and correspondingly advantageous. Any advantage gained from this point of view, however, is counterbalanced by the fact that the boiling of milk certainly alters certain of its qualities, and some think destroys vital properties which are advantageous to the young.

This subject was discussed in an interest-

ing way by Brennemann at the 1916 meeting of the American Medical Association. He pointed out that in European countries milk is almost universally boiled, because raw milk is not consideerd a safe infant food. He thinks, apparently, that any question of raw milk containing vital properties or ferments which are destroyed by boiling is largely theoretical, although he admits that boiled milk is more constipating than raw.

Concerning this point, namely, that boiled milk is supposed to be more constipating than raw, Brennemann seems inclined to believe that it corrects loose stools by being more easily digested than by exercising any constipating influence, and it is possible that giving boiled milk, which is sterile, permits the child to overcome the bacteria already in the alimentary canal, which it would be unable to overcome if it got a fresh army of microörganisms.

Any tendency to scurvy which certain physicians have thought to be more commonly developed when boiled milk is used can probably be set aside by the occasional feeding of beef juice or the employment of orange juice; also there is little evidence that scurvy can be produced by boiled milk.

Summing up his clinical experience, Brennemann says that there is no doubt in his mind that artificially fed babies are in general harder to feed on raw milk than on boiled milk, and this is true not because of bacteriological influence, but because he thinks that boiled milk is more easily digested, raw milk coagulating more rapidly in the stomach in large masses than does boiled milk. Brennemann thinks that all babies fed on raw milk will occasionally pass hard, bean-like curds in the stools which bear no resemblance to ordinary fat curds, and that this is not true to the same extent in children who are fed on boiled milk, the curds they pass, under these circumstances, being much smaller and less hard.

Finally, as his conclusion from a consideration of the entire subject, Brennemann expresses the view that if milk boiled two to five minutes in the consumer's home were as popular to-day as is raw or pasteurized milk, babies would suffer less.

From the discussion of Brennemann's paper it would appear that most of his hearers took similar views, the most notable exception being Kerley, who, however, while advocating the use of raw milk, added the qualifying clause that when safe raw milk cannot be secured the milk should be boiled regardless of who uses it, when or where. Kerley stated in addition that cooked milk is more readily digested in young babies than raw milk, and that milk cooked with starch is suitable food for delicate infants. In many instances it would appear that evaporated milk cooked with a starch will suit the infant when raw milk will not. Altogether at the present time it would seem that the vogue of cooked milk is in the ascendent.

THE QUESTION OF TONSILLAR OPERATIONS.

The readers of the THERAPEUTIC GAZETTE will recall that on a number of occasions during the last three years we have published editorials and progress articles dealing with this important and very active topic, and we have published, amongst the original articles, a symposium in which the pros and cons of tonsillectomy were debated. That there is far too much operative procedure upon the tonsils seems to be universally recognized by those who are best qualified to judge. Gradual recognition that certain endocardial and joint lesions have their origin in some focus of septic absorption has led many men to believe that the tonsils were the offending members and that these glands should therefore be removed. There can be no question that this is the correct view in some cases. There can also be no question that in many instances perfectly normal tonsils are removed, or at least tonsils which if not perfectly normal are not abnormal in the sense that they are doing any harm, but are only scarred veterans of a series of infection battles in which the tonsillar tissue has won the fight.

In this connection we may quote the words of French of Brooklyn when he says, "While all diseased tonsils should be enucleated, it is probably safe to say that eighty per cent of enlarged tonsils do not contain foci of infection and, therefore, do not need to be completely removed, and, indeed, unless obstructive to voice or respiration, do not need to be removed at all." This viewpoint is emphasized if we recall the fact that certainly in the young the tonsils apparently have an important function to perform, and that in older persons they may be considered as barriers against infection.

In this connection we have read with interest a communication by Pottenger, who is interested in this subject from the viewpoint of the student of tuberculosis. He believes that the tonsils are, in a goodly number of cases, distinct protective barriers, as are all lymphoid structures, and, in the discussion of his paper, a number of clinicians side with him in protesting against the promiscuous removal of tonsils.

It would seem that it will not be a long time before we will reach what may be called the "resting point" in regard to this matter. This "resting point" with our present information is so readily discovered that it is remarkable that it has not been arrived at earlier, and it would seem to be this, that where septic foci exist in one or both tonsils, or where repeated attacks of severe tonsillitis show that these tissues are unduly vulnerable, the tonsils should be removed, but that all tonsils which do not seem absolutely normal should not be removed. In some instances where the general practitioner refers a patient to the specialist for tonsillar removal, the specialist removes the tonsils because the patient's physician has stated that he considers it essential, and the specialist naturally believes that the medical man, who is most familiar with the patient, is best qualified to determine what should be done.

In all these cases it should be borne in mind that removal of the tonsils is not so simple a proposition as many people seem to consider it. It involves the use of a general anesthetic, which is somewhat dangerous, and which not infrequently leaves the patient's nervous system somewhat shaken and abnormal, and if an attempt is made to operate under local anesthesia, it occasionally happens that very alarming or even fatal results follow the application of the local anesthetic. Last of all, damage to the pillars of the fauces may result in permanent changes in the resonance of the voice. Tonsils, it would seem, ought to be removed, if they are guilty, but a fair trial as to their guilt should be had and a careful judgment reached before they are executed.

BACTERIOLOGICAL AND EXPERIMENTAL RESEARCHES ON GAS GANGRENE.

The success attending prophylactic injections of antitetanic serum naturally suggests a search for a similar remedy against gas gangrene, the principal cause of mortality in the early period of the war and still constituting a major menace to the wounded soldiers, the now higher percentage of recovery being attributable to a more thorough application of the underlying principles of the surgery of infection—*i.e.,* due to a freer and more rational drainage rather than to newer methods of treatment, or newer and more potent antiseptics.

The bacteriologists have shown that gangrene of a part is not necessarily a sequel of gas gangrene infection, since prompt treatment usually averts it, nor in accordance with clinical experience is superficial emphysema a necessary symptom. High temperature or somnolence, or both, and toxic symptoms in general are always well marked toward the close. Even a putrid odor is not always apparent, this fact being due to other organisms of a lower pathogenesis.

Weinberg (*Proceedings of the Royal Society of Medicine,* July, 1916) notes that sometimes when the discharge from a bad case of gas gangrene is examined, it is found that only one organism is present, namely, the bacillus aerogenes capsulatus described by Welch, now usually called the bacillus perfringens. These, however, are

exceptional cases. There is usually an associated diplococcus; often many other organisms, such as streptococcus, bacillus proteus, and bacillus sporogenes, the latter being a common infection and the one which generally sets up putrefaction. The bacillus refringens is found in nearly two-thirds of the cases of gas gangrene, or gas phlegmon. There is another (vibrion septique) combination of microbes in which the bacillus of malignant edema is the chief pathogenic organism.

Of one hundred cases examined the vibrion septique was found only in four. By many other authors doubtless this bacillus has been confused with the bacillus sporogenes, which like the vibrion septique is motile. Experimentally the vibrion septique develops much less gas in the tissues than does the bacillus perfringens. It is very easy to show how artificial injury of muscle and hemorrhage favors the infection in question.

As to treatment, since the flora of gas gangrene is the same in almost every wound and since a wound may become sooner or later, even a very long time after infection, the starting-point of a grave gas infection, it is evident that early energetic treatment is indicated. This implies prompt treatment; and coincident with increased efficiency of the medical service the number of gas gangrene cases has lessened.

The most essential condition of efficacious treatment is to open the wound immediately as widely as possible, to extract the projectiles and particles of clothing, to cut away all gangrenous tissue, and when a fracture is present to remove all the fragments of bone.

Vaccine has been used, and though not universally accepted has been highly commended by those who have employed it.

The preparation of active serum seems promising. Horse serum prepared by immunizing horses to the perfringens has relatively small activity. Its use according to the author has seemed to be beneficial to certain cases of gas gangrene. The antitoxic serum obtained with the toxin of the vibrion septique or bacillus œdematiens should have a greater preventive and curative action. In animals it is very difficult to cure even in as short a time as half an hour after one fatal dose of toxin has been injected intravenously. It is true that the number of pathogenic organisms of gas gangrene found increases as technique improves and research continues. At the same time the problem becomes more complex. None the less it is not necessary to prepare sera against all the pathogenic microbes found in gas gangrene. It is sufficient to retain only the species most universal and at the same time most pathogenic. These number but three or four: bacillus œdematiens, bacillus perfringens, vibrion septique, and perhaps the organism described by Sacquepee. The plan would be to prepare in the same horse an antipolytoxic serum active at the same time against all these organisms. Experiments have not shown this to be possible. It is possible, however, to prepare separately sera active against each of these species, the sera then being mixed. According to the author's opinion the best method of dealing with a case of gas gangrene, is to inject immediately into the wound and the neighboring tissues a mixture of the sera of the three most pathogenic microbes. The rapid bacteriological investigation then made by an expert will show which serum must be continued.

Weinberg calls attention to the fact that in the preparation of vaccines the time element enters. Therefore the use of omnivalent iodized autovaccine from the wound discharge is advised; this can be prepared in one or two hours. Several injections are made daily or every two days. There is no united opinion on the value of these vaccinations, or indeed of the sera, but the attitude of those who have used them both seems to be distinctly favorable.

The author also speaks of iodizing the wounds, by which he means laking, after having dried out the wound, with iodine 1 grm., potassium iodide 2 grms., water 1 liter. The lower opening of the wound is temporarily plugged. This solution is left in contact for fifteen minutes or longer if a rapid bacteriological examinatoin has shown

the presence of spores. The wound is then gently dried out and filled with dry gauze. It is held that by this rational method of treatment the iodine will not only act as an antiseptic, but will transform the microbes with which it comes in contact into a vaccine. Thus, he holds, we are treating the patients with iodized vaccine prepared *in vitro* and *in vivo*.

Weinberg states that the results of recent researches on gas gangrene have confirmed the great importance of intestinal flora and have shown that there exist in the ground, in mud, and in dung a large number of new microbes most pathogenic to man and sometimes as toxic even as the bacillus tetani. This enables us to understand the etiology and evolution of the different forms of gas gangrene, and at least points the way toward researches which will ultimately lead to a solution of the problem.

THE TREATMENT OF INFECTED WOUNDS.

It is interesting and at the same time somewhat discouraging to note that the intensive study of the best scientific minds in the world has as yet failed to evolve a treatment for infected wounds so clearly and demonstrably effective as to have received general acceptance and universal application. The most promising is probably Carrel's method of applying hypochlorite solutions. The essence of this method is not drainage, but a laking of the entire affected area every two hours. Indeed, some enthusiastic observers feel assured that this treatment properly applied is so entirely efficient for what has heretofore been the bane of surgery that the enormous expenditure of life and efficiency entailed by the conflict will be offset by this great boon. The proof of the universal applicability and complete efficiency of the Carrel method is apparently still wanting even in the minds of those whose opportunities for observing and knowing its results are adequate.

Thus in the Annus Medicus for 1916 published by the *Lancet*, December 30, 1916, under "Treatment of Wounds," it is stated that the method most widely known and received is that introduced by Sir Almroth Wright, who irrigates and dresses with a solution of hypertonic salt, the citrate having been found to be unnecessary. The main function of this dressing is to stimulate the effusion of lymph from the walls of the wound. This lymph possesses important antiseptic powers and also contains leucocytes possessing phagocytic properties. The next most popular application to wounds is a hypochlorite solution. Carrel's special method is mentioned somewhat casually. Chloramine, introduced by Dakin, is said to be five times stronger than the original solution. It is interesting to note that the use of iodine in wounds is now completely discredited and is but little employed. Among other methods is mentioned magnesium sulphate and glycerin; those who have seen its action have expressed themselves as very well satisfied with the results obtained. Hull has introduced the use of salt sacs by which the wound is filled with salt, thus perfectly draining it by osmotic action, the dressings not requiring change for a week.

Solution of salicylic acid, about two drachms of a saturated alcoholic solution to a pint of water, is also found to be an effective lotion. Salicylic acid and gelatin is mentioned, and picric acid; whilst, finally, authority is quoted for a very successful use of vaccines from Swan's article, who makes it a rule that every case arriving from overseas with a septic wound shall, on entrance into the hospital, have an initial dose of a mixed polyvalent vaccine of proteus and streptococcus.

Doubtless if one could converse with either the formulators or users of any of these methods he would find in each case a similar degree of confidence in the method employed, and perhaps results which were good in proportion to the surgical judgment of the individual operator rather than to his choice of an antiseptic.

All we can say at present is that the Carrel method with the Dakin solution seems to give the largest promise.

REPORTS ON THERAPEUTIC PROGRESS.

PARACENTESIS PERICARDII.

In the *Boston Medical and Surgical Journal* of October 26, 1916, LOCKE asserts that whether for diagnostic or for therapeutic purposes aspiration of the pericardium is a procedure altogether too little known. During the past ten years many authors have urged the more frequent employment of paracentesis in pericardial effusions, and in consequence it is now unquestionably much more often done than formerly.

Considering the relative frequency of pericarditis, and its favorable course with spontaneous recovery in many instances, it must be admitted that paracentesis is rarely necessary. It is indicated when the amount of effusion is so great as to give extreme embarrassment to the respiration and circulation and thus endanger life, or when a large effusion shows no tendency to absorption. In occasional cases it is important to establish the nature of the effusion, especially when a purulent exudate is suspected. Sears has emphasized the importance of exploratory puncture in all suspected cases of this type, urging the advantage of early radical treatment of pyopericardium on the same grounds as of pus in the pleural cavity. The favorable results of surgical treatment by pericardiotomy during recent years offer a weighty argument for early aspiration for diagnosis.

Puncture of the pericardium is far less simple than of either the pleural or peritoneal cavities and is by no means free from danger. A dry tap is not infrequent even when a considerable amount of fluid is present—a failure which is explained by the fact that adhesions binding the heart to the pericardium may make it difficult to reach the fluid, or because the exudate is apt to contain a large amount of fibrin with which the needle may become plugged. The *x*-ray examination is often of great value in indicating the position of the fluid in the pericardial sac.

The possible untoward results of paracentesis of the pericardium are several. A few cases are on record of sudden collapse and death immediately following it. The dangers of infecting the pericardium are but slight and can be disregarded if strict attention be given to asepsis. An ever-present possibility is the puncture of the pleura and infection of this cavity if the pericardial exudate is purulent. The gravest complication, but, fortunately, a rather rare one, is the wounding of the heart, leading to fatal hemorrhage. Boxwell reports such a case, in which the ventricle and auricle were punctured and death resulted from hemorrhage. The dangers from this cause seem to be not so much from puncture as of tearing of the heart muscle by movement of the heart over the end of the needle.

The question of the best site for aspiration is a matter of wide difference of opinion, and a great variety of points have been recommended. From the work of Zinn, Blechmann, Schaposchenkoff and Damsch, and others, it is clear that the least amount of the effusion collects in front of the heart, the bulk of the fluid being in the posterior and left dependent portions of the pericardium. The right side of the diaphragm meets resistance from the liver and cannot be pressed down as on the left, where the resistance is less, and therefore the accumulation of exudate in the right lower part of the pericardium is usually small in comparison. This would seem sufficient reason for not choosing the fifth right intercostal space (Rotch's point) as the site for paracentesis. Likewise for the same reason the various points to the left of the sternal border, either inside or outside the internal mammary artery, are unsuitable. Furthermore, the dangers of wounding the heart are greatly increased in this region.

The region most commonly chosen (Curschmann, Zinn, West, Sears, and many others) is the fifth or sixth interspace, 2 to 3 cm. outside the nipple line and inside the outer limits of dulness. The position is one

of the most favorable for drainage of the pericardium, and the chances of injury to the heart are very slight. The needle introduced at this point may transfix the pleura, but this accident is of little or no importance.

One other point of puncture has come much in favor of late, namely, the subxiphoid space of Marfan. The advantages of this method as stated by Marfan are as follows: (1 The distended pericardial sac lies very close to the xiphoid and is very easily entered; (2) the sac is punctured at its lowest part and can therefore be more easily and completely drained; (3) there is no danger of injury to the heart; and (4) there is no possibility of entering the pleural cavity. Blechmann and Rieux believe this to be the most satisfactory and safest method.

EXERCISES TO AID DIGESTION, PREVENT CONSTIPATION, AND STRENGTHEN THE ABDOMINAL WALL.

In the *New York Medical Journal* of October 28, 1916, MOSHER gives these directions:

1. Lie on the back (bladder empty and knees bent). Gently stroke the abdomen downward six times along the inside of the left groin, from ribs to pelvis.

2. Stroke three times across the abdomen on the navel line from top of the right groin to top of the left, then downward as in Exercise 1.

3. Draw the lower abdomen forcibly inward by muscle contraction (not by breath), and imitate the movement involuntarily made in taking a long restful yawn—breathe in slowly all the air possible, stretching the trunk and neck upward, then as slowly breathe out all air taken in. Repeat six or eight times. This exercise can also be taken in the sitting or standing posture and should be repeated often when enteroptosis is present.

4. Forcibly draw in the lower abdominal wall (not by breath but by muscle contraction), then raise it and hold long enough to count ten. Do this three times. Rest and repeat.

If the abdomen is distended by gas, insert a small tube (the rectal point of a syringe) into the rectum before beginning the exercises; if retained, it will let out the gas as fast as it is carried down. Never apply pressure below and to the inside of the right groin (region of the appendix).

These exercises should be taken by every one on retiring, to overcome the sagging of abdominal organs due to the standing and sitting posture. They may be repeated half an hour or more before meals, if indigestion and gas are present.

FUNDAMENTAL PRINCIPLES UNDERLYING THE TREATMENT OF HEART DISEASE.

In the *Journal-Lancet* of October 15, 1916, GREENE says that a factor vital in the consideration of cardiovascular disease is the simple but fundamental fact that, however important the detection and specific differentiation of valvular lesions may be, the vital matter is always the condition of the heart muscle itself—whether its defects be due to a myocarditis, chronic degeneration, or a congenital myocardial asthenia.

Yet another relates to the mental attitude of the student or practitioner at the time of undertaking any examination of the heart. It is to be feared that too often this involves, primarily, the mere question of murmur or no murmur. The result is likely to be in many instances a total failure to appreciate the most significant alterations in the quality and accentuation of heart-sounds on the one hand, and to exalt the importance and specific significance of a cardiac bruit on the other. The fundamental purpose in any such undertaking is the establishment of the presence of normal heart-sounds, and if this be the habit of mind, the detection of any existing murmur is rendered doubly certain.

It is possible that the great importance and peculiar value of the long-focus radiograph and of the characteristic variations in the cardiac profile which it reveals are not sufficiently appreciated. The information thus obtained is so great, with respect both to diagnosis and the effects of treat-

ment, as to make its frequent use obligatory on the part of any one who owns or has ready access to an *x*-ray apparatus.

With respect to the effects of treatment, tentative or formal, one cannot avoid a few words as to the proper and improper use of digitalis, the king of drugs in this field, which, in pronounced cases, finds its greatest value when given the advantage of initial associated physical rest on the part of the patient. Not only are we able repeatedly to demonstrate grades of dilatation falling within the normal limits of the cardiac profile by means of the response of the outline to digitalis, but to yet greater degree and with almost as much illumination in obscure instances is the effect produced by such simple and harmless measures upon the subjective symptoms of cardiovascular insufficiency.

Greene has but these few words of advice to offer: "Use a standardized preparation of maximum reliability and potency, and drive the primary effect home by full doses carried only to the point of producing a definite physiological effect; then withdraw the drug for a few days, and repeat the process as often as may be necessary and over as long a period. Unless impelled by absolute necessity, do not place the remedy in the hands of a patient at a period when the results of adequate administration demand careful medical interpretation, for it is certain to be either over- or under-used, with resulting disappointment to all concerned. The effect of very small long-continued doses, administered after the primary purpose is achieved, is sometimes surprising, but these also should receive some measure of supervision."

Finally, a word as to the general attitude of medical men toward especially serious or apparently hopeless cases of cardiovascular disease. A traditional attitude of hopelessness leads to the abandonment of many cases long before such a step is necessary, and involves the loss of many opportunities to win a victory in the face of what may seem certain defeat. Quite as striking, and no less disastrous, is the assumption that little can be done for the disease of the primary degenerative type which occurs in elderly people. Many a fine old gentleman is permitted to drift along with steadily but almost imperceptibly failing faculties and strength when a little care and treatment at the proper time, and repeated as may be necessary, will greatly prolong his life, and for considerable periods retard the sequelæ of the senile degenerative type.

Greene does not wish to be understood as asserting that organic heart disease is curable or always remediable. He does assert, upon the basis of years of practical application of the principles here enunciated and with all his strength, that at the present time the cardiopath is not receiving at the hands of medical men either the comfort or the length of days readily obtainable in a great majority of instances by the intelligent application of modern methods of diagnosis and treatment.

IMMUNE HUMAN SERUM IN THE TREATMENT OF ACUTE POLIOMYELITIS.

In the *Journal of the American Medical Association* of October 21, 1916, WELLS writes on this topic. He reaches the following conclusions:

1. The administration of immune serum in acute poliomyelitis is based on recognized principles of immunity.

2. Because the lesions are not confined to the nervous system, and because the lesions therein consist essentially of perivascular infiltration, intravenous injection of serum appears to be a rational procedure, either alone or in combination with intraspinal injection.

3. Intravenous injections of serum should if possible consist of doses of from 50 to 100 Cc. or more daily.

4. Following intravenous or intramuscular injections of serum, spinal fluid should be withdrawn.

5. Intraspinal injection of serum usually produces an increase in the number of leucocytes with increase in the proportion of polymorphonuclear cells in the spinal fluid.

6. No ill effects have followed the use of

serum in this series, either by intravenous or intraspinal injection.

7. In all cases after intravenous injection, and to a less degree after intraspinal injection, a noticeable improvement usually occurred, which unfortunately, however, in some cases was only transient.

8. Early administration of the serum is urged, necessitating therefore an early diagnosis of the disease; in severe cases late administration of the serum has produced little if any noticeable influence on the course.

THE RELIEF OF BREATHLESSNESS IN SOLDIERS SUFFERING FROM IRRITABLE HEART.

The *British Medical Journal* of October 14, 1916, contains an article prepared by six medical men on this topic. The object of the present paper is to draw the attention of those charged with the care of military patients to a subtle cause of breathlessness. The reason for their doing so is that they have found it to exist in five of six cases in which the cause of the breathlessness present was so far in doubt as to make a systematic examination of the chemical properties of the blood desirable. The cause of breathlessness to which they refer is the absence of an adequate supply of "buffer" salts in the blood. The patients in whom this condition is present are to be found amongst those who are diagnosed as having "irritable hearts" or "trench hearts"—that is, among the number of soldiers invalided during the period of training or while on active service because they are unable to tolerate physical exercise. In these cases exertion produces some of the following symptoms, namely, excessive fatigue or actual exhaustion, attacks of giddiness or actual fainting, palpitation, and pain usually situated in the precordial region. The patients to whom they refer show no constant physical signs, but in the majority of them the heart-rate is abnormally high when the subjects are up and about. Moderate exercise increases the pulse-rate excessively. It is the rule to find high respiratory rate in these subjects while they are at rest, and in some cases this rate may be as high as 40 per minute.

The "buffer" salts play an important part in the pathology of the cases under consideration.

The blood is at all times receiving and parting with acid and alkali. These variations in constitution, if effected in an ordinary saline solution, would produce changes in relative acidity and alkalinity which would be physiologically intolerable; their effect on the brain alone would be to excite or depress its various centers to extreme limits. The respiratory center, for instance, would be stimulated to violent dyspnea by the acidity resulting from trivial exercise; it would be brought to a standstill by a moderate acquisition in alkali. A given addition of carbonic acid to the blood only produces a quarter of the change in reaction which it would produce in a corresponding quantity of physiological saline solution. Thus, if 100 Cc. of blood should be taken and the same quantity of normal salt solution, 1.3 Cc. of carbonic acid dissolved in the saline would change its reaction to the same extent as 5 Cc. would change that of the blood. The reason of this is that the blood contains such substances as sodium bicarbonate, monacid and diacid sodium phosphates, and protein, which tend partly to fix the acid so that in a sense it loses its chemical freedom. For the sake of example the attention may be confined to the two phosphates, Na_2HPO_4 and NaH_2PO_4. If a little carbonic acid is added to a solution containing these two salts, a little sodium bicarbonate is formed, which is alkaline. The sodium is acquired by the CO_2 at the expense of the phosphates, so that there is less of the alkaline Na_2HPO_4 and more of the acid NaH_2PO_4 than before. The net result is a slight increase in the acid reaction. The blood forms a more complicated system of this type. The salts to which they have alluded are therefore called "buffer" salts, because they ease the shock to the reaction of the fluid caused by the addition of acid or alkali.

The bearing of these general observations on the cases of breathlessness which they

have studied is perhaps best explained by recounting the history of their investigation of a single case. The results were as follows:

1. That when all the CO_2 was shaken out of the blood it was somewhat more alkaline than normal blood.

2. That with the amount of CO_2 normally present in the body it was just on the acid side of normal; and

3. That any further addition of acid increased the acidity to an abnormal degree.

These observations seem to the writers to be important, first of all because they demonstrate an altered state of the blood, which goes far to explain the otherwise inexplicable breathlessness in certain patients who suffer from the condition described as irritable heart. They are important from another standpoint: the temptation to cover our ignorance of the pathology of the malady as a whole by referring many of its symptoms to instability or to irritability of the central nervous system was a powerful one, so long as clear deviations from normality could not be found. These investigators think that their observations carry us from the abstract to the concrete, and tell us that we deal with an affection in which disordered metabolism plays a conspicuous rôle.

[The conclusion from a practical standpoint would seem to be that such cases may be benefited by the intravenous injection of a 4-per-cent solution of sodium bicarbonate. —Ed.]

THE ANTAGONISM BETWEEN ATROPINE AND CERTAIN CENTRAL EMETICS.

In the *Journal of Pharmacology and Experimental Therapeutics* for October, 1916, Eggleston gives the results of a series of experiments on animals and concludes:

1. Experiments on dogs have shown that pilocarpine, nicotine, morphine, apomorphine, emetine, aconitine, and ouabaine produce vomiting through direct stimulation of some portion of the central vomiting mechanism.

2. In dogs small doses of atropine, given shortly before or together with pilocarpine, or nicotine, prevent the emetic action of both of these drugs, but not that of the other drug mentioned.

3. Doses of atropine similar to those which antagonize the emetic action of nicotine and that of the smaller doses of pilocarpine are too small to cause demonstrable effects in dogs when given alone.

4. The doses of atropine effective against the emetic action of pilocarpine, in whatever dose used, fail to antagonize such other actions of pilocarpine as stimulation of the salivary and bronchial glands, of intestinal peristalsis, and of the bladder to contraction.

5. The ratio of the antagonistic dose of atropine to the dose of pilocarpine was determined for the minimal emetic dose of the latter and for each of several multiples thereof.

6. The effectiveness of the antagonistic action of atropine toward pilocarpine increases progressively as the doses of both drugs are raised, so that while the ratio of atropine to pilocarpine is 1:75 for the minimal emetic dose of the latter it is 1:125 for eight times the minimal dose. Or, when the minimal dose of pilocarpine is raised eight times the dose of atropine has to be increased only about five times to antagonize its emetic action.

7. Hyoscyamine is nearly eight times as active as atropine in antagonizing the emetic action of pilocarpine.

Finally he believes that:

1. Atropine and hyoscyamine are capable of antagonizing the vomiting produced in dogs by some central emetics—pilocarpine and nicotine—and are incapable of antagonizing that of other central emetics—morphine, apomorphine, aconitine, emetine, and ouabaine.

2. The antagonism of atropine or hyoscyamine toward the emetic action of pilocarpine and nicotine is not of a chemical nature, but is physiological and takes place upon the center.

3. The observations suggest a complexity of the vomiting center, including at least two different points of action, or sets of re-

ceptors, for chemical stimuli. The one is stimulated by pilocarpine and nicotine and depressed by atropine. The other is stimulated by morphine, etc., but not by pilocarpine and nicotine, and is not depressed by atropine.

BACTERIAL VACCINES IN TREATMENT OF PULMONARY TUBERCULOSIS.

The *Journal of the American Medical Association* of October 21, 1916, contains an article by BONNEY in which he discusses this subject. He well emphasizes the fact that even when apparently characteristic evidences of mixed infection are present, an element of real doubt as to the propriety of vaccine therapy is unavoidable, as the syndrome may, after all, be of essentially tuberculous origin. Irrespective of these considerations as to pathogenesis, and with a just appreciation of the inevitable uncertainties of action, it appears, nevertheless, permissible to resort to vaccine therapy under the conditions enumerated.

In Bonney's experience the results obtained in a fair proportion of cases in which there was moderate fever have been such as to encourage its further cautious employment. No assurances as to its probable effect can be given, and patients should be made to understand that its use is largely experimental. Under a wisely directed management they have but little to lose from its trial and perhaps something to gain.

This is also true to a great extent in connection with its employment in afebrile cases. While the greater proportion of such invalids may be expected to make fairly satisfactory progress under proper supervision without recourse to vaccine therapy, occasional indications for its administration may be found in patients with distressing cough and abundant expectoration. Many of these cases without fever exhibit more or less cavity formation or bronchiectasis with varying degrees of fibrosis. Under these conditions, even if but slight loss of weight has taken place, the constructive change is necessarily slow, while if nutrition is seriously impaired the difficulties of successful management are very considerable. The application of vaccines to patients of this class is quite appropriate and the results are sometimes gratifying. Bonney can cite numerous cases under his own observation in which the vaccines proved of appreciable benefit, and he can present a few rather exceptional instances of the remarkable improvement sometimes achieved. Notwithstanding these decidedly picturesque examples, which though impressive are infrequently observed, the facts remain that his own clinical experience suggests for vaccine therapy but a limited field of usefulness. As a routine method of treatment in pulmonary tuberculosis it cannot be too strongly condemned. As a special measure of occasional value, but often of doubtful utility, it appears worthy of a judicious trial in selected cases.

TREATMENT OF WEAK LABOR PAINS.

RUSHMORE in the *Boston Medical and Surgical Journal* of November 9, 1916, in discussing the value of pituitrin says that the results are not uniform, but that certain facts seem to be pretty well established. For example, the dose is about one-tenth of a gramme of the gland substance, corresponding to one cubic centimeter of pituitrin, but varying somewhat with preparations of other manufacturers. Increasing the dose above this quantity does not seem to increase the action, and such variations in result as appear seem to be due to variations in the susceptibility of the patients. For if the contents of a one-cubic-centimeter ampoule be divided equally between two patients, there may be a marked effect in one and no effect in the other.

It may be given subcutaneously, intramuscularly, or intravenously. While there is little difference between the subcutaneous and the intramuscular injection, the latter method is generally preferred. It should be given intravenously only in an emergency to check postpartum hemorrhage, for its action is not only almost immediate, but stormy and accompanied by unpleasant but

not serious general symptoms. By mouth it has no effect. After intramuscular injection the action is evident in from five to fifteen minutes, though sometimes later; if there is no reaction from the first dose in half an hour, a second may be given. But if no reaction follows the second dose, the patient is considered refractory and no further injection should be made.

The effect on the uterus during labor is peculiar and characteristic, producing a type of pains which closely resemble the normal. There is an increase in the uterine tone, with an increase in the force of the contractions, and a shortening of the duration of the contraction as well as the interval between the pains. The shortening of the interval is most marked at first, when the pains may occur in such quick succession as to give rise to a tetanic contraction of several minutes' duration. But generally no tetanus results, the interval, though short, being clearly defined. The effect lasts for about an hour, with its acme in the first half-hour, and is generally not followed by a period of noticeable relaxation. It seems more active the nearer the patient is to physiological term, and if in labor the nearer the patient is to the end of labor. But in inducing labor it is of no value.

In regard to its use after the birth of the child there is wide difference of opinion, indicating that more study and observation are necessary to clear up this aspect of the question. Its injection has been recommended at the moment of birth to diminish normal bleeding, and it is undoubtedly valuable for intravenous use in postpartum hemorrhage, where it acts promptly and uniformly. Thus it removes the need for intrauterine manipulation and to that extent diminishes the danger of infection.

Certain reports on the use of pituitrin would lead us to think of it almost as a panacea, with no failures, no bad effects, and no contraindications. But a more thoughtful study of cases and a review of the literature show that it sometimes fails and sometimes does serious harm.

The failures ought to be studied with great care. They may be divided into two groups: first, those in which there was no uterine reaction—found chiefly in elderly primiparæ and in women with undeveloped uteri; second, those in which the reaction was not of sufficient force to produce the expulsion of the child. It is this second group that especially demands attention, for here are the cases in which the misuse has been most obvious.

The bad effects outside the uterus are occasional, but never serious, at least as hitherto reported, and consist of pallor, faintness, cyanosis, and irregularity of the pulse. The serious bad effects are in causing tetanus of the uterus, which has led to asphyxia of the child and occasionally to rupture of the uterus.

The indications for the use of pituitrin may be summarized briefly. Before it is administered a careful examination should be made to determine whether the child can be born through the birth canal. The cases of rupture of the uterus have come chiefly from the neglect of this precaution. If it seems probable that the child can be so born, pituitrin may be given, first, for uterine inertia in the first or second stage. It has been recommended for both primary and secondary inertia, but Rushmore is inclined to be very cautious in its use before the cervix is dilated two and one-half inches.

The second group of cases comprises several subdivisions: those cases in which labor pains are normal, but for some definite cause increased activity is needed, as in a breech and occasionally in a face presentation; if the disproportion between the presenting part and the pelvis is slight; to avoid exhaustion of the mother from undue prolongation of labor; in eclampsia in connection with dilating bag. The only indication that needs comment is the use in eclampsia. Some have feared the dangerous effect of the rise in blood-pressure, but this is not great, and Rushmore thinks we have a choice of evils, of which he considers the rise of blood-pressure less than the prolongation of labor. It may also be used as a prophylactic against bleeding in Cæsarian section.

A word should be said about adrenalin in this connection. Its effect in producing uterine contractions was noticed in 1901, but the study was not prosecuted with much vigor at first, and later interest was distracted by pituitrin. But it is the most powerful and promptly acting oxytocic that we have, causing contractions in dilution of one to two hundred millions, and producing a powerful effect in dilution of one to fifty millions. It is contraindicated during labor because it produces tetanus, but for postpartum hemorrhage it is prompt and efficacious though temporary in its effect. It is best injected into the uterine muscle, as intravenously it is dangerous and subcutaneously not very effective. Ten minims of the one-to-one-thousand solution may be injected into the wall of the uterus as high as may be reached on pulling down the cervix.

CONTROL OF SCARLET FEVER.

In the *Boston Medical and Surgical Journal* of November 9, 1916, LEWIS, Health Officer of New Haven, Conn., states that he has practically abolished recurrent cases, made infrequent secondary cases, and lessened reported cases, by demonstration of the carriers of convalescence and the carriers previously having had the disease, and by isolating these carriers.

Results of the so-called grading of quarantine do not depend on the quarantine, but upon the fact as to the presence of the carrier being within or without the family circle.

Full liberty may be safely given to all contacts who are free from the signs of the disease at the time of isolation of the one sick and the carrier.

Control of scarlet fever will be found to lie in the supervision of those who have previously had the disease, at and during these periods when with intercurrent infections they again show the buccal-pharyngeal signs of scarlet fever. Secondarily, missed cases and the convalescent reported cases are of equal importance.

THE MANAGEMENT OF POLIOMYELITIS, WITH A VIEW TO MINIMIZING THE ULTIMATE DISABILITY.

LOVETT writes in the *Medical Record* of October 21, 1916, on this topic. He deals first with the treatment of the acute phase —*i.e.*, from the onset to the disappearance of tenderness. In this stage nature is attempting to repair the damage done to the cord, especially to the motor area. Rest and absence of irritation and of meddlesome therapeutics should constitute the treatment at this stage. There is no evidence that drugs are of any use, nor would one reasonably expect much from counter-irritation, external applications of heat or cold, or from electricity.

It is not physiological to irritate and stimulate the peripheral ends of nerves connected with affected and hemorrhagic nerve centers by massage and muscular exercise while the acute process, as evidenced by tenderness, exists. Joints will not be ankylosed, muscles will not hopelessly atrophy, and the patient will not become bedridden because he is kept quiet for as long a time as need be to enable the damaged cord to repair without interference. Deformities may occur in two or three weeks after the onset and must be prevented by support of the feet at a right angle (where the most common early deformity appears) by plaster-of-Paris splints or some similar simple contrivance. This policy of doing nothing is trying to the parents who have heard of the wonders of massage and of electricity and are anxious that no time should be lost, and trying also even to the experienced surgeon when the tenderness is of unduly long duration. There is evidence to show that hexamethylenamine prevents or delays the infection in monkeys, but no evidence to show that it is of use after the infection has occurred. Immersion in a warm saline bath is agreeable and apparently beneficial toward the end of this stage, and may be comfortably carried out by immersing the patient on a sheet. There is reason to hope that the administration intraspinously of the blood serum of recovered patients as early as pos-

sible in the onset of the disease is a therapeutic measure of value in diminishing mortality and limiting the paralysis.

The treatment of the acute stage may be summarized as follows: Rest, the avoidance of meddlesome therapeutics, the prevention of deformities, and probably the early administration of the blood serum of immune patients.

As to the treatment of the convalescent phase, Lovett points out that during this period one faces squarely the question of muscular care and development. The destructive process has ceased, the harm has been done, the development of the possibilities of what remains is the problem. He believes that in this stage the amount of ultimate function is largely determined, and we must remember that nature is assisting us to the best of her ability with the great asset of spontaneous improvement, which is more marked in the first six months than in the second six, and more marked in the second six than in the last six months, of the two-year period arbitrarily allotted to this stage.

Perhaps certain data with regard to the gastrocnemius muscle may make clear what seems to Lovett to be the general behavior of muscles during this time. The calf muscle should normally be able to exert a force in pounds of from two to three times the body weight of the individual. This muscle is very frequently weakened by poliomyelitis. If it is partially paralyzed and is immediately protected by a high heel when the upright position is assumed, this throws it out of use in walking. If walking is restricted and if the muscle is judiciously exercised, in all cases that he has observed it has gained in muscular strength, and in two cases it has been quantitatively recorded as returning to the normal amount of power within two years. If it is not so protected and exercised, it has in all cases which he has observed lost power and stretched, with the acquirement of a calcaneous deformity of greater or less degree; whether it goes on to a complete loss of power cannot yet be said, because the quantitative observations on which these statements rest have not yet covered a sufficiently long period. But what happens to the gastrocnemius muscle, which is easily measured and checked and observed, undoubtedly points to a general rule governing the behavior of other muscles not so easily observed and measured. So that in formulating the treatment for this stage the different reaction of this one muscle to protection and to overfatigue may be borne in mind as probably typical.

With regard to the specific treatment of this phase, when the tenderness has wholly disappeared, or at the end of six weeks or thereabouts in cases in which there has been no tenderness, the question arises whether we shall begin to get the patient up or whether we shall continue recumbency, and here there is ground for a perfectly reasonable difference of opinion, probably soon to be settled in New York City by the immense experience in the present epidemic.

Those who would keep the patient recumbent for months argue that in that way they avoid fatiguing the convalescent muscles, that the damaged nerve centers have ample time given them for complete recovery, and that muscle training and massage can be carried on perfectly well while the patient is in bed; all of which is perfectly true.

Lovett's own experience has led him, however, to feel that soon after the acute stage is over it is on the whole better to get the patient on his feet; that is, in about two or three months after the attack. The prolonged recumbency is not favorable to the circulation, which is intended to work at least some of the time in the upright position. The nervous system of children is not desirably affected by such prolonged confinement, and what is more important is that when the patient is put on his feet there is an instinctive effort to balance and hold himself upright, which exercises muscles not otherwise to be reached. But this ambulatory treatment must meet the objection that fatigue may be incurred by an attempt to get about, which is perfectly true, and this must be guarded against. If the people are not intelligent enough to

follow directions, prolonged recumbency would undoubtedly be the best treatment, provided, of course, that deformities were prevented. It has been too much the custom in the past to allow children to sit around for months and years with no treatment worthy of the name until they acquired the deformities of flexed hips, flexed knees, and dropped feet, all favored by prolonged sitting. Still, although this danger exists, it is not a serious objection to the treatment by prolonged recumbency properly carried out. The only danger is that the unqualified advocacy of prolonged recumbency might seem to sanction a method which has been productive of great harm in the past in the hands of inexperienced persons.

THE POSTFEBRILE TREATMENT OF ANTERIOR POLIOMYELITIS.

In the *New York Medical Journal* of October 14, 1916, ASHLEY states that it is generally conceded that the acute stage of this disease extends from the onset to the subsidence of pain and tenderness, a period varying from four weeks to three months, a time sufficient to establish grave deformity. It is apparent that orthopedic measures should be instituted by the physician in attendance during this period to combat or prevent deformity. All too frequently a tendency to deformity is started at this time that is irreparable. In this paper the writer accentuates three points:

First, the folly of no treatment in the postfebrile stages, while the patient still has pain in the nerve and the muscles are exquisitely tender.

Second, the importance of early treatment to combat deformity.

Third, the harmful effect of too much treatment, in all stages.

From our knowledge of the pathology of the disease we know that during the time immediately after subsidence of the fever there must be given a time to absorb the hemorrhage and perivascular infiltration which have compressed vessel and nerve cells to the point of occlusion on the one hand and death on the other. It is manifest that irritation of these damaged, diseased nerve cells would be increased by a peripheral irritation or excitement.

This is the time to support the parts—to prevent stretching by weight of bedclothes that would produce drop-toe, to prevent stretching of weak muscles and capsular ligaments and nerves by early sitting, standing, or assuming sprawling positions in bed, resulting in the drop-shoulder and the flail joint, the overextended hand or knee, the flexed knee or thigh, crooked spine, pendulous abdomen, etc.

This is the period of light diet, good nursing, warm, dry packs, sheet baths, rest in bed—firm, not too hard and not sagging—support of paralyzed parts by non-constricting braces, plaster-of-Paris, sandbags, etc.

There must be no massage, no electricity, no muscle training, no strychnine injections to irritate so long as pain and tenderness are in the muscles, pointing to an active disease still existing within the cord. At this stage any such measures are harmful in the extreme, and should not be administered until pain and tenderness have subsided—a time, as said before, varying from four weeks to three months.

In severe paralysis, especially, maintain the patient in the horizontal or inclined position for six months or longer. A Bradford or Whitman frame will permit daily excursions in the open air, when the patient may be turned over and placed at an angle to the horizontal position.

The value of prolonged recumbency is a debatable question. The patient's health should be closely observed and the horizontal or inclined position discontinued if the general health demands it. The writer is of the opinion that the disadvantages of recumbency have been exaggerated, when we consider the marked gain in weight by these patients and other children that demand the recumbent position, as in treatment of the tuberculous spine.

In the convalescent stage, beginning seldom before four or six weeks and lasting for six months to two years after the acute

attack, more therapeutic measures may be demanded. In severe paralysis the recumbent position is most highly recommended, as it prevents serious deformity of the spine. At this stage, if the patient assumes a position of deformity when standing, he should have a brace to enable him to walk, to support the drop-shoulder, the crooked spine, etc.

This brace should support without constricting the partially paralyzed muscles. The narrow bands, denting the weak muscles, are to be condemned. Use a broad webbing or leather cuff. Great care must be exercised through frequent observations to discover and combat any tendency to deformity by application of an efficient brace, shoes, or sleeping frame. As in the postfebrile stage, the limbs must not be permitted to dangle or assume positions that will stretch weakened muscles or take on contractures that would necessitate lengthening by surgical procedures to correct the deformity.

Massage at this period offers the greatest encouragement, and this massage should be given daily or twice a day. The parent is instructed to give the massage. It is the writer's opinion that much harm is done by too long and too vigorous massage. It was the teaching of Professor Lorenz that five minutes of massage to a limb was sufficient. More was harmful, being fatiguing to the patient and breaking down rather than stimulating or building up.

To the mind of the writer the object of massage is to stimulate and bring warmth by inducing an increased blood stream to the part and emptying veins and lymphatics. It is really feeding these muscles, and they should have two meals a day. They will not thrive on one large meal or even three meals a week. The masseur whom you send to give massage to your private patients generally spends an hour upon these patients—to earn his money—and he does more harm than good by breaking down more than he can build up, leaving the patient almost prostrated by fatigue.

In this connection Doctor Lovett, of Boston, has warned us of the ill effects of fatigue, which must be avoided if we would not harm our patients. He calls attention to the fact that muscles are generally only partially paralyzed, the proportion of partial to complete being nine to one, and these are likely to be permanently injured by fatigue, an eventuality that should be carefully guarded against in administering massage.

Heat is another therapeutic remedy easily applied and should accompany the bath once a day. For the same reason as massage, it stimulates the blood stream. Hot baths of gradually increasing heat—the mother or nurse holding her hand in the water as more hot water is added; hot dry packs, warm, woolen clothes, two pairs of stockings, no restricting garters, flannel binder around the waist for the pendulous abdomen. Cold inhibits muscular movement, and is to be used only after a hot bath for a moment, followed by alcohol and water half and half and a vigorous rubbing or massage.

THE CLINICAL IMPORTANCE OF THE DETERMINATION OF SUGAR TOLERANCE IN MEDICAL PRACTICE.

The *Indian Medical Gazette* for September, 1916, in an editorial article states that there is little or no difficulty in recognizing a large excess of sugar in the urine: we are in possession of many methods and have at our disposal several eminently satisfactory tests. On the other hand, it is often a most difficult matter to decide, in doubtful cases, whether or not a condition of glycosuria is present. How very frequently do we obtain, by the ordinary clinical methods of examination, an indefinite or even suspicious reaction for sugar. In a very large number of instances these doubtful cases are passed over without further investigation; the reaction being ascribed to drugs, excess of urates, pigments, etc.; the true explanation in the majority of cases being often entirely unsuspected. Most authorities now agree that there is a very small percentage of sugar normally present in the urine; at the same time it is becoming more and more recognized that there is a preglycosuric

stage in diabetes during which the sugar content of the urine is rising, although the arbitrary methods of measuring the reducing power of the urine in such cases are not sufficiently accurate and conclusive to enable us to state dogmatically that the quantity of sugar present is in excess of the normal amount. There can be no doubt that most forms of glycosuria and diabetes have an insidious onset; any method, therefore, by which we can make certain whether the indefinite reaction obtained by Fehling's test means a greater than normal percentage of sugar in the urine—indicating a lowered tolerance to carbohydrates—should prove a great boon to practicing physicians.

In these instances of doubtful Fehling reaction, and they are continually occurring, it is most important to be able to say whether glycosuria is present or not; for, if there really is an excess of glucose, however small, it indicates that something is amiss with carbohydrate metabolism; it is a danger-signal which, if heeded and the proper treatment applied, may unquestionably enable us to stave off the incidence of an otherwise fatal diabetes. It is very generally accepted by clinicians that a diminution or total withdrawal of carbohydrates from the diet enables the organism to reacquire much of its lost power of carbohydrate assimilation, and it is just in the early stages of the disease—the preglycosuric stage—that the greatest benefit can be derived by a proper dietary control—*i.e.*, before the organism has begun to suffer severely from the toxic effects of excess of sugar in the blood.

By means of a very simple clinical test we are in a position to determine whether or not a patient, whose urine gives a suspicious Fehling reaction, is a potential glycosuric. It is only necessary to give the individual from 50 to 100 grammes of glucose, and if, after half an hour, the urine contains an appreciable quantity of reducing substance, we may be fairly certain that dietary control is necessary to prevent the gradual development of glycosuria and diabetes.

In accordance with the "dextrose paradox," or the "paradoxical law of dextrose"—the remarkable power of every non-diabetic organism to utilize dextrose in absolutely unlimited quantity—the normal organism is able to deal effectively with large quantities of glucose without sufficient appearing in the urine to give a positive Fehling reaction. In the non-diabetic, the vastly greater part of any dose of dextrose is retained; part of it is burned, as proved by the respiratory quotient, part of it is stored as glycogen, and part in other forms, and, from experiments carried out in connection with the diabetic inquiry in the Physiological Laboratories, Medical College, Calcutta, there is only an infinitesimal rise in the normal percentage of sugar in the blood.

In the diabetic organism the reverse is the case. In "total" diabetes, as after pancreas extirpation, doses of sugar do not affect the respiratory quotient; they do not cause any deposition of glycogen; they are quantitatively excreted. Both these powers are lost, so that the dextrose saturates tissues that are starving for it but are unable to make use of it. In the various forms of glycosuria, due to overproduction of sugar, no matter how great may be the glycosuria, the power to retain and dispose of administered dextrose is absolutely unlimited; merely an increase in dose is necessary to obtain increased utilization. The theory, therefore, that diabetes is solely an overproduction of sugar—a glass running over—falls to the ground.

CONSIDERATIONS IN THE MEDICAL TREATMENT OF GOITRE.

In the *New York Medical Journal* of October 21, 1916, ANDERS states that thyroid extract and iodine are contraindicated in the therapeutics of this form of goitre, if we except cases in which myxedematous changes occur as the sequel of secondary atrophy of the thyroid gland. The signs and symptoms of the concurrence of Graves's disease and myxedema are mental dulness, dryness of the skin, falling of the

hair, scleroderma, and, more important, supraclavicular swellings and a non-pitting edema. In this class of cases thyroid feeding from time to time is most useful in removing the features just enumerated.

One of the principal factors in the treatment of Graves's disease consists in the removal of recognizable causes. Certain writers describe a "secondary" or symptomatic variety, superinduced by special sources of irritation. It is undeniably true that the removal of these foci may, in rare instances, result in decided benefit, but Anders knows of no cures that have been effected in this manner. Putnam, however, correctly observes that "when the nervous system has been under the tax of bearing several loads at once, the removal of any one of them may suffice to communicate a new 'set' to the nerve functions or to provide the amount of relief needed to make recovery possible." It follows that an attempt should be made to remove intensifying sources of peripheral irritation whenever found to exist, with the reasonable hope of rendering medical and hygienic measures effective.

Among other prominent causative factors are emotional excitement, shocks, tuberculosis, rheumatism, syphilis, and intoxication from the intestinal canal.

When Graves's disease supervenes as a sequel of acute rheumatism, the use of sodium salicylate often yields excellent results. The writer has seen at least one striking and apparently complete cure from the exhibition of the salicylates. Their use should be interrupted for a few days at intervals of about one month. In cases in which syphilis is associated with Graves's disease, the employment of salvarsan is to be advised and encouraged. In a case reported by Ziegel, favorable results were obtained.

In four fully developed cases recorded by Epstein, as the result of large rectal injections of oil, with the purpose of removing all impacted fecal masses, an absolute cure was established. He holds that coprostasis with absorption of intestinal toxins is a very common symptom of the disease, and even in cases in which diarrhea is present there may be pronounced fecal impaction. W. H. Thomson likewise emphasizes the possible influence of autointoxication from the intestines as a causal factor, and excludes all meats from the dietary in order to prevent its development.

S. Solis-Cohen states "whether or not the disorder is originated by the absorption of toxic products from the intestine, it is certainly aggravated thereby." In Anders's belief a careful regulation of the diet, thorough evacuation of the intestine by means of colonic irrigation with either a hot saline solution, as advised by Cohen, or large oil injections as recommended by Epstein, once or twice weekly, to obviate toxic absorption, cannot be too strongly emphasized. He has found heavy mineral oil administered internally of much service in unloading the bowel during the intervals between the irrigations.

Intestinal antiseptics are of distinct value in selected cases of exophthalmic goitre, the most effective, in his experience, having been betanaphthol, salol, and guaiacol carbonate.

Cases in which a clinical factor, other than shock, physical or emotional, is operative do not lend themselves to satisfactory medical treatment. In Anders's belief this view is tenable in no limited sense, judged by an extensive experience. True it is that many of the distressing and alarming symptoms can be relieved by various vaunted remedies, and in exceptional cases a cure may follow; but rarely indeed are the results so favorable as those achieved by timely surgical intervention. Clearly, since the knife offers so much more than our therapeutic armamentarium in these cases, it is the plain duty of the internist and general practitioner to request surgical aid without too much delay. If operation is refused by the patient—a not infrequent occurrence—or a contraindication exists (rarely), then medical treatment should be undertaken.

At the outset it is to be recollected that certain hygienic measures are vastly more important to the patient than any known

drugs or organotherapy. These patients are often greatly injured by being advised to travel or to take exercise. What they need in view of the presence of the circulatory disturbances, increased metabolism, and myasthenia, is rest of both body and mind. At the beginning of a course of treatment, massage and passive exercise should be substituted for muscular activity. Later, with improvement in the patient's strength, gradually increased exercise, carefully prescribed, may be advised, but should not be carried to the point of fatigue.

Hydrotherapy has been found to be useful. In general, however, a daily tepid bath to insure cleanliness is sufficient. Baths that tend to induce exhaustion are contraindicated. The environment should be cheerful, but free from mental excitement on the one hand, and all depressing influences on the other hand. The value of fresh air, judiciously taken, is undoubted. In addition to the usual methods of taking the air, the patient should be encouraged to recline out-of-doors, well protected against cold, sudden changes of temperature, and strong winds. The foregoing measures—rest, followed by suitable exercise, fresh air, a proper environment, and bathing—are more useful than drugs in controlling tachycardia, neurasthenia, and insomnia.

It is sometimes necessary, however, to supplement them by other means. For example, the tachycardia and palpitation may require the use of an ice-bag over the precordia, and a weak, rapid heart the administration of cardiac stimulants. As regards digitalis, it may be said that it often fails to control the tachycardia of this disease, and when employed it should be discontinued when found to be without favorable effect. Strychnine in small doses is effectual in combating cardiac weakness.

Of the numerous available remedies which have been advocated, two are worthy of elaborate mention. These are quinine hydrobromide and antithyroidin Möbius, the latter being prepared from the serum of thyroidectomized sheep and preserved by the addition of 0.5-per-cent carbolic acid. This product is available in bottles containing two and a half drachms (10 Cc.) and may be administered in doses ranging from ten to sixty minims, two or three times daily. It has no cumulative action. [In this country this remedial agent is called thyroidectin.—Ed.]

It is customary to continue the use of antithyroidin until the contents of one bottle are taken, and then to omit it for a few days, when it is to be resumed. Unfortunately, we are still ignorant, as Dock has pointed out, of the amount of this remedy requisite for the best results. Elsner and Wiseman state that antithyroidin confers benefit "by relieving the annoying and alarming symptoms of exophthalmic goitre in typical and atypical cases." In their experience the greatest improvement is found in the relief of the tachycardia, precordial distress, and tremor. This improvement was hastened by rest in bed and close attention to diet, and in serious cases it was necessary to continue the treatment during many months.

Personal experience confirms that of Elsner and Wiseman just cited. Antithyroidin causes the enlarged thyroid to lessen in size, but not beyond the normal dimensions. The relief afforded to the distressing nervous phenomena of the disease by antithyroidin, and its apparent harmlessness, combine to stamp this as a sovereign remedy in exophthalmic goitre. As in the case of the use of thyroid extract in myxedema, so it is found wise to administer antithyroidin after the active symptoms have subsided, during periods varying from four to eight weeks, at intervals of two to three months.

The second remedy worthy of careful consideration in connection with the therapy of Graves's disease is the neutral hydrobromide of quinine, first proposed by Forchheimer. Anders's custom has been to prescribe it in five-grain capsules three times a day after food, later increased to four doses of the same strength, daily, if well borne. The remedy is to be continued until the subjective symptoms, the tachycardia, and tremor have disappeared, after which it is to be diminished until a single

dose is taken daily. Should active symptoms arise during this tentative withdrawal of the drug, it must be resumed in full doses at once. The hydrobromide of quinine antagonizes hyperthyroidism, probably owing to its vasoconstricting effect, but it does so in a slow and gradual manner, hence patients should be told that they must be prepared to use it continuously for a period of months.

SOME RECENT ADVANCES IN CARDIOLOGY.

In the *Indian Medical Gazette* for November, 1916, WILLMORE points out as regards the treatment of heart disorders that the question whether digitalis should be given or not is of great importance.

Let us try and answer it in the light of recent research. It should hardly be necessary to reiterate the maxim: Never give digitalis unless there are signs of heart failure. To give digitalis to any patient who comes to us with an aortic or mitral murmur and who does not show signs of heart failure is to commit a therapeutic crime.

The difficulty is this—we have all experienced it: In one case we give digitalis with immediate and great benefit; to another, apparently similar, and there is no appreciable result. What is the reason? We say the drug was old and had lost its strength.

No! digitalis is a very stable drug. The secret is this: digitalis is of marvelous value in cases of auricular fibrillation and is of practically no value in any other condition. How does digitalis act in auricular fibrillation? It is a cardiac poison and it acts especially on the auriculoventricular bundle—it depresses conduction.

In auricular fibrillation we have all sorts of hurried, haphazard impulses passing down to the ventricle, which, in responding to them, is worried almost out of existence.

Depression of conduction makes it more difficult for these impulses to pass. The ventricle beats more steadily, slower; it carries on the circulation more efficiently. Heart failure is averted or removed. The first essential therefore is a correct diagnosis.

How should digitalis be given? It must be remembered that when auricular fibrillation sets in it is nearly always permanent. Digitalis must therefore be given permanently. It should be given on the same principles as mercury is given in syphilis.

The digitalis must be pushed until the toleration point is reached. Just as in giving mercury the aim is to just touch the gums and then to lessen the dose, so in auricular fibrillation digitalis should be pushed until symptoms of poisoning appear. The symptoms of digitalis poisoning are nausea, vomiting, undue slowing of the pulse; and above all a coupling of the heartbeats—a bigeminy of the pulse. This last is a danger-signal which should not be reached. [We think that this is carrying the effects of the drug too far.—ED.]

The proper amount to give is that smallest dose which will steady the ventricle and which does not produce symptoms. It may take some weeks or months to find the optimum dose in any special case. Having been found, the patient should ordinarily take it for the rest of his life.

In conclusion two fundamental facts in connection with heart disease may be emphasized. In any case of cardiac disease the factor of prime importance is not the valvular lesion, it is the lesion of the muscle. If the cardiac muscle has escaped the effects of the injection or degeneration, as the case may be, the degree of valvular inefficiency is of little moment—the reserve power of the heart is almost incalculable. If the muscle is damaged a very slight degree of valvular mischief will suffice to produce heart failure. The second is the very great importance of breathlessness as a symptom in heart disease. In any particular case the degree of breathlessness may be taken as an index of the amount of heart failure—increasing breathlessness means increasing heart failure, and *vice versa*. And this does not apply to advanced cases of heart disease—the symptom mild in degree is the first to be looked for. If any individual becomes breathless in per-

forming acts he was formerly able to do with impunity, it is certain that the reserve power of his heart is diminished. [Provided pleural effusion is excluded.—ED.] The symptom of breathlessness, therefore, should always be actively inquired into in every case of heart disease.

THE PROPHYLAXIS AND TREATMENT OF TETANUS.

MCGLANNAN in the *Military Surgeon* for January, 1917, in discussing this subject states that without attempting to reconcile the differences of opinion we may consider some of the advantages of iodine in the treatment of an infected wound.

1. It is practically non-toxic and therefore may be used freely.

2. It is not a caustic and does not sear the surface of the wound.

3. It will prevent the growth of ordinary pyogenic organisms.

4. It produces a marked and long sustained local hyperemia. This last is probably its greatest value.

The treatment of the wound, however, is not so important as is the prophylactic injection of antitoxin. If one or the other must be postponed, delay in the wound treatment is the lesser evil. This point is of great importance in military surgery. Wound treatment beyond the simplest first aid is rarely possible for many hours or even days after the occurrence of the injury. The injection is a simple procedure, and with a sufficient supply of antitoxin available could be carried out at the advanced dressing station and at the station for the slightly wounded.

Aschoff and Robertson recommend soaking absorbent cotton in antitoxin and drying it. This impregnated cotton may be applied to large wounds, and when it becomes moistened by the secretion, the antitoxin is liberated into the tissues. The possibility of utilizing this device is called to the attention of the recently organized First-Aid Conference.

On account of the frequent persistence of the tetanus bacillus in the tissues, the protective action of the serum is limited to a period of ten or twelve days. If the wound has not entirely healed in this length of time, the injection should be repeated.

For the same reason it is necessary to administer a prophylactic dose before operating on sinuses or the wounds of those patients who have been exposed to infection.

The treatment of tetanus aims to provide for six conditions:

1. The neutralization of the toxin in the cerebrospinal fluid and in the blood.

2. Limiting or preventing the development of toxin at the focus of infection.

3. Interruption of the flow of toxin from the wound to the central nervous system.

4. Preservation of the nutrition of the patient.

5. Prevention of convulsions by protecting the patient from external stimuli.

6. Control of convulsions by abolition or obtunding of reflexes.

The first condition is met by the injection of antitoxin into the spinal canal and intravenously. Ashhurst and John outline a method of treatment, which has been modified by the work of Park and Nicoll.

Ten to fifteen thousand units of antitoxin are given intravenously, and 5000 units into the spinal canal. The spinal injection is given through the needle which has made a preliminary lumbar puncture. Should the spinal fluid be under increased pressure, a rare occurrence, a quantity equal to or greater than the volume of the antitoxin should be removed before making the injection. When the symptoms are marked, ether anesthesia may be required for making the puncture.

There is a difference of opinion regarding the management of the wound after the disease has developed. On the one hand, excision is advised for the purpose of removing the focus; on the other, it is condemned on the ground that such an operation only opens up new avenues for dissemination of toxin and bacteria.

The best method seems to be non-interference unless the wound clearly requires opening for drainage and disinfection. Oc-

casionally it may be well to make injections of antitoxin into the tissues around the wound. Hydrogen peroxide, oxygen spray, etc., have no specific value in treating the wound.

For the third condition intraneural injections of antitoxin are efficacious. Such procedures as section of all the nerves from a limb, bringing the peripheral ends out of the wound for drainage, are unnecessary and unduly radical. The same seems true of the introduction of drainage tubes into the nerve.

It is better judgment to refrain from all avoidable traumatism and to rely on the antitoxin introduced into the cerebrospinal fluid and the blood, for combating the toxin.

The nutrition of the patient is of extreme importance. As long as he can swallow without difficulty, this is a simple matter. When dysphagia is present, and when the spasm of the jaw muscles keeps the mouth tightly closed, the problem becomes difficult. Nutrient enemas help for a short time, but every effort must be directed toward the relaxation of the spasm.

Morphia hypodermically is most useful in early cases, in which spasm of respiration and deglutition are often the only symptoms. Chloral hydrate, in doses sufficiently great to produce a distinct stupor, is valuable, but the large doses necessary, 20 to 25 grammes (!) daily, are not without danger.

Magnesium sulphate intraspinously is valuable, but not free from danger on account of paralysis of respiration. Subcutaneous injections of this drug are easier to give but are also somewhat dangerous. A 20- or 30-per-cent solution is used, and beginning with 5 Cc. the dose is gradually increased until diminished reflex activity is produced. A 5-per-cent solution of calcium chloride, or some 1/60 grain eserine tablets, should be available as an antidote.

After the injection, the spasms usually relax in about an hour and the effect of the drug lasts about six or eight hours. The injections are repeated as soon as symptoms return. Tightness of the chest and difficulty in swallowing are usually the earliest signs of returning convulsions. Magnesium glycerophosphate has been advised, in place of the sulphate, in the hope of overcoming some of the bad effects of the latter salt.

All manner of desperate means have been advised for control of the spasm of respiration. Section of both phrenic nerves was successfully done by John for the relief of this spasm. Intratracheal insufflation should be kept in mind as a means for supplying air without respiratory movement.

Bacelli's phenol injections have received few reports in the war literature. The method has been used by several civilian observers in the last five years, but the results of this treatment are not as good as those of the serum method.

The results of intraspinous and intravenous administration of antitoxin far surpass those of any other form of treatment, and whenever antitoxin in sufficient quantity is available, this should be the method of choice for treating tetanus. With a scarcity of antitoxin, the intraspinous dose should be given rather than the intravenous.

Magnesium sulphate injections are valuable in military surgery because this agent is cheap and is usually available. The prolonged abolition of reflexes may permit the comfortable and safe transportation of the injured man to a base hospital. Combined with a dose of opium, this seems the best preparation we can give a tetanus patient for exposure to external stimuli, when the exposure becomes necessary. The symptoms of tetanus are aggravated by rapid travel; therefore the hospital train should not go faster than 20 miles an hour.

As is true of all infections, the efficacy of the treatment of tetanus varies directly with the period of the disease at which it is instituted. Early diagnosis and prompt treatment give the best hope for success.

The early symptoms of tetanus are not marked but are quite distinct.

Pain and stiffness in the muscles of the region of the wound may be mistaken for a simple myalgia, but this is easily differentiated by exaggeration of the local re-

flexes, which exaggeration becomes progressive. Twitching and stiffness of the muscles, when these are tapped, is an evidence of increased excitability.

Pain about the mouth, fatigue on chewing, and slight difficulty in swallowing, without any cause for this condition evident in the throat, are early and very certain signs, in a suspicious case.

Cramps in the chest muscles, generally described as a stitch in the side, and a sense of tightness in the chest, are other early symptoms.

Profuse sweating and a rapid pulse precede the onset of distinct lockjaw.

Starting at noises, at lights or in draughts, is evidence of undue reflex sensitiveness, and if occurring in the wounded, should give rise to a strong suspicion of tetanus.

CHLOROFORM IN OBSTETRICS.

FULLERTON in the *Cleveland Medical Journal* for November, 1916, says that chloroform is unquestionably a more powerful and toxic drug than ether, but so is scopolamine more powerful than codeine and must be administered with greater care and precision. The same applies to chloroform. The margin of safety is much narrower and the administration demands more skill and closer supervision. Since the danger of toxic effects increases with the prolongation of administration, chloroform anesthesia is not desirable for prolonged anesthesia such as may be necessitated by all operative deliveries excepting the simplest of low forceps.

So much for the several objections to the use of chloroform anesthesia during labor. Let us next consider its advantages. Such authorities as Engle, Veit, Müller, Carstens, Marcy, Williams, Cragin, Slemmons, and many others indorse the use of chloroform in normal cases, and it is the routine obstetric anesthetic in the Sloan Hospital for Women, New York, and the Johns Hopkins Hospital, Baltimore, as well as in other institutions too numerous to mention. In the first place, chloroform is less bulky to carry and much more agreeable for the patient to take, especially to those who have formerly been nauseated by ether. When properly administered during the latter part of the second stage, and particularly when the head is emerging from the vulva, the patient can be freed from all pain quickly and completely with a minimum amount of anesthetic. The patient is instructed to notify the attendant when she feels a contraction starting; three or four drops of chloroform are then let fall on an Esmarch mask covered with not over six thicknesses of gauze, and the patient instructed to take several deep breaths, after which the mask may be removed as anesthesia is sufficient to abolish pain, yet the patient voluntarily or on being urged will make expulsive efforts. As the head descends and the vulva dilates the anesthesia is gradually deepened, so that when the head passes over the perineum the patient is completely anesthetized. As soon as the head is born the administration is stopped and the patient will, when no excess of anesthesia has been administered, regain consciousness in three or four minutes. The amount of chloroform for such a procedure rarely exceeds one to one and a half ounces, much of which has been lost off the open mask and not inhaled. The rapid recovery of consciousness and almost invariable absence of nausea and vomiting are agreeable and convenient features. Although recovery of consciousness is rapid, there is usually sufficient time, if one is prepared, to place any necessary perineal sutures, which may be tied immediately, or this act postponed until after the completion of the third stage.

If the anesthetic must be administered by a nurse or member of the household, closer supervision is necessary, but anesthesia is more quickly established and usually without the stage of excitement so common with ether, during which asepsis is so easily broken. For easing the pains of the latter part of the second stage of labor, and for complete anesthesia as the head is emerging from the vulva, chloroform is most satisfactory. So little anesthetic is necessary and anesthesia so quickly recovered from

that no important retardation of labor is observed, whereas if ether be used and sufficient given to produce an equal freedom from pain, the uterine contractions are delayed and decreased in intensity and the necessity for operative interference markedly increased.

Now to summarize the comparison of these two anesthetics. Chloroform requires greater attention and care and is more readily administered by an untrained attendant. The greater rapidity of action of chloroform and its more hasty elimination render it preferable to ether for eliminating most of the pain of the late second stage and actual delivery. Chloroform properly administered delays labor to a less extent than ether, and by making the patient more comfortable and thereby enabling her to use her accessory expulsive forces actually decreases the length of labor. Chloroform should never be given in the so-called toxemias of pregnancy, nor for prolonged anesthesia such as is necessitated by any but the simple operative procedures. Postpartum bleeding is no more profuse after chloroform than after ether, and if at all, is but very slightly more profuse than after delivery without anesthesia.

These factors make chloroform preferable to ether in normal spontaneous labors, especially in multipara with short second stages. Chloroform should not be given before the second stage is well advanced, and should then be administered in amounts only sufficient to abolish most of the pain. The length of administration will rarely and should not exceed thirty to fifty minutes, and the amount should average not over one ounce. Chloroform should always be administered through an Esmarch or other open mask and never in concentrated form.

In closing it is perhaps opportune to say that when available, and in trained hands, nitrous-oxide-oxygen is the anesthetic *par excellence* for anesthesia during not only the second stage but the latter part of the first stage as well, and then when used and somewhat more relaxation is required when the head is emerging from the vulva than is usually obtained with nitrous-oxide-oxygen, a few drops of chloroform through an open mask will produce the required relaxation in minimal time, with least discomfort to the patient and most satisfaction to the attendant.

"NEEDLING" PAINFUL SPOTS, AS PRACTICED BY THE CHINESE.

In the *China Medical Journal* for November, 1916, CANTLIE writes that from time immemorial the Chinese have practiced "needling" the body for the relief of pain, of swellings, of stiffness, and in the treatment of many ailments. The practice has become with them an art—an exact science, in fact, if the term science can be applied to such a proceeding.

The model of the human body in brass, with its many indicated puncture points, is a well-known feature of wonder to the northern Chinese, and the pictures of the model are met with throughout the Empire.

To each one of the hundreds of puncture points indicated in the model a curative effect is attached, and the modern student of surface anatomy may well stand aghast when asked to interpret the several structures any particular puncture might traverse when pushed deeply; and the clinician will be puzzled to explain the possible effect likely to be produced thereby. We may and do say: "There is something in it;" but we seldom if ever venture to practice it, except occasionally in an experimental and tentative fashion, as, for instance, by placing an electric needle in the sciatic nerve.

Is the idea one of counter-irritation merely, or is it practiced with the idea of puncturing circumscribed effusions which, owing to their presence, distend the tissues and thereby engender localized pains? It is scarcely possible to suggest any other reason for the employment of "needling," but either the one or the other is sufficient to justify its use if it can be proved that good results obtain.

The Chinese have other and less severe methods of counter-irritation. Nothing is

more common than to see the skin of persons in China suffering from fever and many other ailments covered with circumscribed contusions produced by "nipping" the skin between coins (cash). This procedure is more easy of accomplishment and less technical than needling, and as a counter-irritation more potent. It would appear, therefore, that the puncturing of fasciæ is the reason for the practice, and the only possible way in which "needling" can claim to be a rational treatment. It may be asked, Is the puncturing of fasciæ to relieve tension so frequently required as a means of treatment? The fact is, we know little of such a pathological condition; for instance, what do we know of the real pathological state in lumbago? Our treatment is empirical because our knowledge of the ailment is limited—it might be said non-existent. Is it an effusion into the mass of lumbar muscles? If so, then is the mystery explainable and the puncture of the thick fascia covering the muscles justified as a rational therapeutic agent. This is evidently the reason for the Chinese practice of "needling," which undoubtedly relieves pain and shortens the duration of the ailment. Relieving tension when an organ is inflamed is a sound and long-practiced method of treatment in scientific medicine. It is chiefly confined, however, to a few organs only; at one time free incisions for orchitis were in vogue, but beyond that and subcutaneous inflammation the procedure is seldom carried. Were it extended to inflammation of the liver, the lungs, glands, and other organs, good might and, theoretically, should ensue.

Any one acquainted with puncturing the liver by a needle in search of liver pus knows well that after, say, half a dozen to a dozen unsuccessful punctures the temperature often falls, the enlarged liver diminishes, and a rapid cure of the hepatitis occurs. By this procedure the severe tension of the liver capsule is relieved, blood escapes into the cavity of the peritoneum from the punctured points, and the condition is ameliorated or the ailment cured. Were lobar pneumonia treated similarly, equally good results might be anticipated, but the procedure is not included amongst the methods of treatment to-day; yet during search for liver pus we often traverse the lower part of the right lung, which in all cases of hepatitis is deeply congested, with great benefit to the lung itself. That this frequently occurs has been brought home to the writer, as the patient coughs up some blood as a result of the lung puncture, a result which acts beneficially in every instance this has occurred.

So impressed has the writer become that he has adopted "needling" for many ailments, amongst which are the following:

1. So-called rheumatic pains in the gluteal region and in the neighborhood of the hip-joint when pain is not relieved in any other way.

2. For pains passing down the back of the thigh, frequently associated with neuralgic pains over or in the sciatic nerve, and forming part and parcel of a general tenderness in hip, hip-joint, and thigh.

3. To dispel swelling and pain around the shoulder-joint in which a "rheumatic" type of pains and conditions following an injury to the shoulder has set in.

4. For "lumbago" due to (*a*) injury, or to (*b*) "rheumatism" ascribed to chill, when either is of long standing and other remedies fail.

5. To dispel the stiffness and swelling so apt to follow a sprained ankle.

6. When after a fracture of the leg or other parts the tissues become so bound together that the muscles are hampered in their action and ordinary massage fails to improve matters.

7. Over the sacrum and adjacent area of the pelvis, in which pains in woman, ascribable to pelvic trouble, are so frequently complained of.

The most frequent necessity for treatment arises, however, in the region of the hip, where one has to deal with those indefinite pains in both men and women usually styled sciatica.

Dr. Wm. Bruce, of Strathpeffer, taught the writer that much of the sciatica diagnosis so frequently made is not due, at any

rate primarily, to the sciatic nerve at all, but to changes in and around the hip-joint, and that the chief tender spot in connection with these changes is in the post-gluteal region, just above or behind the sciatic notch.

The writer has followed Dr. Bruce's teaching, and is so convinced of the truth of his statements that, not content with mere massage, he has "needled" the surroundings of the hip-joint above and behind, and punctured at times even the capsule of the joint itself.

In another type of hip ailment the writer has used "needling" with benefit. To give an example. A man playing tennis "did something" to his hip which "lamed" him for a time. Rest, fomentations, electricity, massage, etc., were applied, and still the trouble remained for many months. In the course of some two years he never was rid of a "crippling" pain, especially after he had sat still for some time. Thinking to hasten matters, he tried exercise again, and when playing tennis was again seized by "sciatic" pains, which necessitated resting for a time. The trouble continued and rather increased in severity. On examining him when he came home on leave from abroad a definitely tender area was found in the gluteal region, above and behind the great trochanter, leading up to the crest of the ilium, just about the spot where the last dorsal nerve crosses the ilium. Defying all known treatment, the writer, using an anesthetic, on two occasions punctured the area of the hip deeply, most of the punctures reaching down to the bone. The punctures were made down the thigh along the tract of the sciatic nerve, down to the back of the knee. The needles were also made to puncture the capsule of the hip-joint at three places. The method of manipulation consisted of holding a harelip pin in either hand and rapidly thrusting each deeply into the tissues, over a hundred punctures being made in the space of two or three minutes.

The benefit of this treatment was apparent, and its repetition still further continued to do good.

This short account of "needling" may serve to bring up for discussion a practice which has tradition—that is, experience—for its justification; and there can be no doubt that as a rational treatment it has much to recommend it.

THE ACTION OF VERATRONE IN THE TREATMENT OF ECLAMPSIA.

In the *Edinburgh Medical Journal* for December, 1916, HAULTAIN concludes from its use that it may be stated that we have in veratrone a drug of the utmost value in the treatment of eclampsia, as shown by its success in the treatment of 38 consecutive cases. After the initial dose of 1 Cc. subsequent doses should be regulated by the blood-pressure of the patient, as by so doing it can be given with safety and to the greatest advantage.

THE USE OF PITUITARY EXTRACT FOR THE INDUCTION OF LABOR.

In the *Interstate Medical Journal* for December, 1916, ADAIR reaches these conclusions:

1. The use of pituitary extract for inducing labor, particularly in premature, mature and post-mature cases, should not be abandoned.

2. It appears to be of value in bringing on labor in premature cases in some instances, and is worth a trial where it is not necessary to end the pregnancy rapidly.

3. In cases with ruptured membranes it is of value in initiating uterine contractions.

4. In cases of placenta previa marginalis or lateralis, where the membranes rupture or are ruptured artificially, it is of value for starting uterine contractions and may save the necessity of intrauterine manipulations.

5. It is a help in cases in which mechanical means are used to induce labor and may limit the amount of manipulation necessary.

6. In cases at term it is of value in starting labor.

7. It should be used in cases going overtime before any other method of inducing labor is resorted to, except in those cases

in which it is contraindicated or it is necessary to terminate the pregnancy more rapidly. [To which advice we would add, never use it in a pregnant woman unless the os is well dilated.—ED.]

THE DIAGNOSIS AND CLINICAL CHARACTERISTICS OF GOUT.

PRATT in the *Boston Medical and Surgical Journal* of December 28, 1916, reminds us that the prompt relief from the pain produced by colchicum in gout is so striking that many have asserted that this drug is a specific in gout. It is certainly an aid in diagnosis, as colchicum does not have such a marked effect in relieving the pain in acute rheumatism or in other conditions which may be confounded with gout. Salicylates rarely have any marked effect in controlling the pain of acute gout.

The relief from the severe pain of gout by atophan is even more striking than that produced by colchicum. Its value in diagnosis is probably less, as it often is of considerable aid in checking the pains of nongouty arthritis.

THE CONTROL OF STRYCHNINE CONVULSIONS BY INTRASPINAL INJECTIONS OF MAGNESIUM SULPHATE.

CUTLER and ALTON in the *Journal of Experimental Medicine* of January 1, 1917, state that they feel that the results obtained in a human case and in their animal experiments justify the supposition that magnesium sulphate may be of use in controlling cases of poisoning by strychnine. It is a method easily available, not only in large hospitals but in private practice, and requires no elaborate technique. The amount of magnesium sulphate to be used should follow the advice of Meltzer in tetanus cases: intraspinally 1 Cc. of a 25-per-cent solution to each 20 pounds of body weight in adults, and one-half the dose in young children. Should this not control the convulsions a small amount of ether may be used. In order to hasten the excretion of strychnine, 200 to 300 Cc. of salt solution should be given intravenously. In the event of the return of the convulsions, the intraspinal dose may be repeated, always taking precautions to keep the head elevated. Meltzer's apparatus for the intrapharyngeal insufflation and a 2.5 per cent of calcium chloride should always be on hand in case of respiratory failure following an overdose of the magnesium salts (Meltzer).

TREATMENT OF SEPTIC WOUNDS WITH GLYCERIN AND ICHTHYOL.

In the *Journal of the Royal Army Medical Corps* for December, 1916, ALDERSON states that at the divisional rest station in France, where practically all the operations were of the type carried out in the surgical out-patient department of a civil hospital, namely, the opening of superficial abscesses, it was decided, after reading Major Duggan's articles in the *Journal of the Royal Army Medical Corps*, to try dressing these cases with glycerin and ichthyol instead of boracic fomentations. At first a 20-per-cent but later a 10-per-cent solution, spread on ordinary white lint, was used, and later, for purposes of economy, commercial glycerin was substituted for pure glycerin. Fifty-nine cases were thus treated after operating under an anesthetic, besides many others of which no record was kept, and in which no anesthetic was necessary. They included carbuncles, whitlows of all types, and three cases of cellulitis, two of the upper and one of the lower limb. In favor of this treatment are the following points:

1. Saving of labor and material—one application daily being substituted for three boracic fomentations.

2. Efficiency as a dressing. In several of the cases previously treated with boracic foments, the discharge was never more in twenty-four hours on the one glycerin and ichthyol dressing than on any one of the fomentations, though these had been changed twice and thrice daily.

3. The dressing does not adhere to the wound.

4. Men voluntarily told the nursing or-

derlies that they found the ichthyol dressing more soothing.

This treatment is therefore recommended to medical officers, civil and military, for use in dressing superficial septic sores and wounds, as being (*a*) equally efficacious, and (*b*) more economical, as regards time and material, than the boracic fomentations.

PERTUSSIS.

ABT states in the *Archives of Pediatrics* for December, 1916, that the value of vaccine in the treatment of whooping-cough is still under consideration. The reports are conflicting. Some are sanguine. Alfred Hess (*Journal of American Medical Association*, Sept. 19, 1914) found no curative results from the use of vaccine during the disease, notwithstanding the fact that he used an autogenous strain in one series of cases. According to his statistics the prophylactic treatment cannot be regarded in any sense specific. Of 244 cases that were vaccinated 20 came down with the disease.

Matthias Nichol and Paul Luttinger treated whooping-cough with stock vaccine, and came to the conclusion that the average duration of the treated cases was twenty-five days, and that cases which received both commercial and stock vaccines, eight in number, lasted forty days.

Paul Luttinger, in his latest communication, says that when the proper vaccines are used there has been a shortening of the paroxysmal stage, and a reduction in the severity and number of the paroxysms.

Out of 2103 patients with pertussis, 75 per cent of whom were treated with vaccines, 15 deaths occurred; 10 of this number were treated with medicine and one with injection of the vaccine. The other four were treated with vaccines exclusively, two of them being commercial vaccines and two others the stock vaccine prepared by Luttinger himself. No death occurred in any patient who presented himself before the third week and received the vaccine treatment regularly.

As a prophylactic, Luttinger thinks that the vaccine is efficient if used sufficiently early, and that it is capable of aborting the disease if no time be lost in its use.

The possibility of immunizing by vaccination is still an open question for pertussis. Those who received prophylactic injections, as well as those who did not, remained free from the disease in about equal numbers.

Fresh-air treatment, good hygiene, and efficient nursing are the most important factors in the treatment of the disease. So far as drug therapy is concerned, there undoubtedly are medicines which relieve the paroxysms and insure rest and quiet for the patient. These are found among the antispasmodic and sedative drugs.

There is scarcely a disease where so many drugs have been employed and later on abandoned for some more popular remedy. The list of drugs is a very long one. It is to be hoped that a specific remedy will be secured which will prevent and cure the disease if used sufficiently early. One will suffice.

[The practical difficulty in private practice is the objection of mother and child to repeated needlings.—ED.]

SUBLINGUAL MEDICATION.

In the *Practitioner* for December, 1916, MURTZ tells us that for the last twenty years he has extensively employed the sublingual method of medication, and he is fully in accord with what Dr. W. Paulson said in the *Practitioner* for October, 1916, concerning this method. He adds that the selection of the sublingual space is the one *par excellence* for the rapid transmission by absorption of crushed hypodermic tablets into the circulation, and patients take very readily to this mode of treatment. This is an important matter in private practice, where very fastidious patients are constantly to be reckoned with. No matter how carefully we use the hypodermic syringe, and apart from the risk of infecting the patient, the objections to its use are numerous. Practice has taught that the piston of the syringe will refuse to act unexpectedly, that the needle is blocked, the glass cracked, or the mountings have come

off. Murtz has several hypodermic syringes of the latest patterns, and keeps them in an excellent condition, but he very seldom uses them except by the express wish of a patient who has had injections before. A syringe will not lie idle very long before it becomes faulty, and the constant attention one has to pay to the fine wires within the needle is a serious handicap to the physician. By the sublingual method, all that he has just mentioned is avoided, the exhibition of the remedy is a direct one, and no mechanism of any kind is required.

ON THE CAUSATION AND TREATMENT OF "RHEUMATIC" CONDITIONS.

Writing in the *Prescriber* for December, 1916, WALLER expresses the belief that the treatment of rheumatoid arthritis is still eminently unsatisfactory. The same remark applies equally to a host of allied conditions designated as fibrositis, lumbago, sciatica, muscular rheumatism, neuritis, and so forth, all of which may loosely be grouped as "rheumatic." Salicylates, though undoubtedly of extreme value, seem to be more potent in the disease which we term rheumatic fever, or acute rheumatism, but even in this complaint the number of crippled hearts emphasizes the need for some advance in treatment. Correct treatment must depend on a correct estimate of the pathology of the disease under consideration. Acute rheumatism, which we will consider as a synonym for rheumatic fever, very commonly starts with tonsillitis, though not always. Waller has seen a case in which the infection started apparently in the nose. There are many who also think that the other group of complaints, which may be loosely termed rheumatic, are also due to germs. We have gonococcal and pneumococcal arthritis as definite examples, and also cases of septic arthritis, where the organism is a streptococcus or staphylococcus. But in rheumatoid arthritis the joints have hitherto proved sterile. Nevertheless, the analogy is so great that one cannot help feeling that here also some germ is at work. But where? The fashion of late years has been to assume that oral sepsis is the cause. It is, of course, essential to eradicate oral sepsis in any case of rheumatoid arthritis, and the teeth should always be the first point for investigation. But in some cases of rheumatoid arthritis all the teeth were taken out many years ago, while the rheumatism began quite recently. Waller does not wish to underrate the importance of septic teeth (pyorrhea and chronic abscesses at apex of root fillings) as a cause of rheumatoid arthritis, but he cannot help feeling that the real seat of the trouble is in the intestinal canal.

Sir Arbuthnot Lane has practiced resection of the large intestine in some cases of rheumatoid arthritis, and his photographs of joints, before the operation and after, leave no room for doubt that benefit has followed. Perhaps it is better to part with tonsils, teeth, and large intestine than to have rheumatoid arthritis. But one may be pardoned for seeking simpler remedies. Waller's best successes so far have been obtained with vaccines, mixed streptococcal, staphylococcal, and bacillus coli. The addition of B. coli to the vaccine has appeared to be highly beneficial in some cases, but possibly it acts in a roundabout way. He is quite sure that there is a reflex relationship between the colon and the stomach. Clinically he has observed frequently that a mild colitis is an accompaniment, or the precursor, of hyperchlorhydria. Perhaps the colon, irritated by the particles of what it considers to be insufficiently digested food, sends messages to the stomach to do the work better, and the stomach tries to obey. Such a reflex would at least seem to be common sense.

This combination of mild colitis and hyperchlorhydria has, in some cases that Waller has seen, been commonly followed by rheumatoid arthritis, again of a mild type. A joint would become acutely painful to movement for a day, or perhaps be merely uncomfortable for a longer period, and then get well, though some grating could always be elicited. These considerations have urged upon him the desirability

of finding an intestinal antiseptic for use in "rheumatic" cases, and for this purpose he has been using mercuric chloride. He made considerable trial of this drug in hospital practice while salicylates were soaring in price, and it served him very well, though it still leaves much to be desired. In two or three cases it was wonderfully effective. One boy of about sixteen, suffering from subacute rheumatism, had been taking 10 grains of sodium salicylate thrice daily for six weeks or longer with very little improvement. His troubles promptly cleared up on changing the prescription to liq. hydrarg. perchlor., m. xx, t. i. d. Waller also had some cases of "neuritis" that were promptly relieved. He has not tried big doses, because he did not want to risk mercurialism in hospital out-patients that he might not see for two or three weeks. He tried a mixture of calcium chloride, hydrarg. bichlor., and cascara for chronic rheumatoid arthritis, and fairly good results were reported. Latterly he has given a mixture of sodium salicylate and liquor hydrarg. bichlor. as the two or not incompatible, and it seems to be an improvement on sodium salicylate alone. He might add that there was no reasonable ground for suspecting syphilis in the cases that improved on mercury. He merely gives these clinical observations for what they are worth. It would seem that they may profitably be followed up.

[The observation that this treatment is efficient may be correct. The belief the mercury bichloride acts in the stomach and intestine as a direct antiseptic must be an error.—ED.]

THE INFLUENCE OF ACIDOSIS ON HYPERGLYCEMIA IN DIABETES MELLITUS.

In the *American Journal of the Medical Sciences* for January, 1917, EPSTEIN and FELSEN state that the observations made in their study of this subject point to the following conclusions:

1. The withdrawal of food from certain cases of diabetes provokes or aggravates the acidosis.

2. The acidosis causes an increase in the blood-sugar content, in one of two ways: (*a*) by augmenting the mobilization of sugar, and (*b*) by affecting the sugar-secreting function of the kidneys.

3. Liberal, but judicious, administration of carbohydrate may control the acidosis provoked by the withdrawal of carbohydrates or complete fasting, thus leading to a general amelioration of the diabetes.

4. A progressive rise in blood-sugar content, associated with a gradual fall in the alveolar carbon dioxide, is indicative of impending coma.

THE THERAPEUTIC USES OF BULGARIAN BACILLUS.

In the *Memphis Medical Monthly* for October, 1916, GRAY quotes Clark as asserting that the most impressive facts which stand out boldly as the result of this method of treatment in infantile diarrhea are:

1. The gain in weight, in spite of the number of stools.

2. The rapid change of color of stools.

3. The rapid subsidence of fever.

4. The absence of mucus and blood from the stools at the end of forty-eight hours.

5. The fact that the hygienic surroundings of the patients and the degree of intelligence of the mothers had no influence on the results.

6. A starvation diet, accompanied by purgation, is productive of loss of weight and strength, and serves to prolong the course of the disease.

7. In severe cases the best results are obtained by administering a large number of tablets during the first two or three days of the treatment, as many as 42 Bulgarian tablets in twenty-four hours having been given to very young babies without untoward effects.

8. The implantation method of treatment has progressed beyond the experimental stage, and the result of its use can no longer be questioned or disputed. This treatment has proved of practical, clinical, and scientific value, and its simplicity should appeal to every practitioner.

9. In order to secure the best results in using the implantation treatment, a pure culture of the true bacillus lactic acid Bulgaricus must be employed, otherwise disappointment will follow.

Gray's own results have been identical with those of Clark. In 87 cases of fermentative or putrefactive diarrheas of children, treated in the past two years, there has not been one failure.

He is unwilling, as yet, to omit the preliminary mild purgation with calomel, since he believes he gets quicker results, especially in cases with fever, with it. After that he orders two tablets in a little sweetened water with each feeding, and feels secure in the knowledge that the little patient will be improving within forty-eight hours.

His experience with this treatment in adults is more limited. Three cases of toxic angioneuroses, two manifested in the form of erythema multiforme, and one in a chronic urticaria, have been relieved.

One case of chronic intestinal indigestion, closely simulating recurrent appendicitis, is very much improved. Two other cases of intestinal indigestion, with embarrassing formation of gas and borborygmus, are seemingly cured.

One case of pellagra, in a male of sixty-seven, with a persistence of red tongue and slight diarrhea, after disappearance of other symptoms, is entirely relieved.

A case of pulmonary tuberculosis, complicated with chronic nephritis and ptosis of the abdominal viscera, is showing much improvement in digestion and evidence of less strain on the kidneys.

It will be useless to expect good results from this treatment unless a pure, viable culture of type "A" bacillus lactic acid Bulgaricus is secured and due care is taken to keep the organisms viable. From the time the cultures leave the laboratory until they are administered to the patient, they should be in a temperature of not exceeding 60° F., except for the very short time while in transit. This can be done by purchasing from a dispenser, who keeps them in a refrigerator, and by directing that they be administered from the refrigerator at home. If this care is not taken disappointment will surely result.

COMPARATIVE VALUE OF THE METHODS OF TREATING TETANUS.

In writing on this topic in the *American Journal of the Medical Sciences* for December, 1916, GIBSON says that it is presumed that the wound treatment will be that suitable to the injury and particularly to the most efficient form of drainage and liberation of sloughs, removal of foreign bodies, etc., that may harbor tetanus germs or favor their development. He doubts if to-day we are justified in performing an amputation for the relief of tetanic manifestations, as in the intraspinal administration we have gone a step further in efficiency. Likewise, he will omit the question of nursing and the use of sedatives. One sedative, however, should be alluded to, as it has been thought to have curative qualities *per se,* namely, the chloretone treatment advocated by Hutchings.

Gibson is also inclined to make a trial of atropine as a method of controlling spasm, as this drug has lately impressed him greatly in the treatment of spasmodic contraction of the pylorus.

Antitoxin treatment should be begun immediately on suspicion of tetanus developing rather than waiting for the classical symptoms. If this principle is firmly established, he believes we shall have done much to lessen the dangers of the disease. Antitoxin should be given at once, first into the wound or region of the wound, say 1500 units, intraspinally, without an anesthetic, unless the treatment of the wound calls for the administration of a general anesthetic, 5000 to 20,000 units. In the course of the first twenty-four hours, in addition to the above, 10,000 to 20,000 units should be administered intravenously in divided doses, say two or three. Antitoxin intravenously from 5000 to 15,000 units should be given next day no matter whether the symptoms remit or increase. On the third day, if, notwithstanding the

treatment, the patient's symptoms continue very severe or appear worse, the intraspinal treatment should be repeated. The intraspinal, of course, gives temporary increase of symptoms and steep elevation of temperature, but this fact need not of itself cause alarm. If after this treatment the patient holds his own or improves the intraspinal need not be repeated, but the daily injection of antitoxin intravenously should be given until obvious remission or cure results.

The severity of the cases will, of course, vary, and the resulting treatment will depend on this factor. He calls attention to a case which received a total of 139,000 units, which included 29,000 units given intraspinally in six sessions, in this case, daily, although Gibson doubts if this frequency is often indicated.

His series of cases reported is small, and he is fully aware of the dangers of deducing results from such material. On the other hand, he is under the impression, although he finds it hard to put into words, that although many of these cases were of the severest type and very ill, he had, particularly in the intraspinal method, complete control of the situation. With this feeling of confidence, therefore, he would hesitate to offer any other method of treatment until there is better evidence of the superiority of other methods.

SALVARSAN IN THE TREATMENT OF THE DOUBLE INFECTIONS, TUBERCULOSIS AND SYPHILIS.

In the *American Journal of the Medical Sciences* for December, 1916, POTTER reaches these conclusions:

1. The prompt employment of salvarsan or neosalvarsan is indicated in latent, chronic, and moderately active tuberculosis: (*a*) as soon as the nature of an added infection is diagnosed with reasonable probability to be syphilis; (*b*) whenever the history, signs, or symptoms strongly suggest a previous luetic infection, particularly if such a patient is not improving upon the usually successful hygienic and climatic treatment for tuberculosis; but (*c*) active tuberculosis, acute tuberculosis, and diffuse miliary tuberculosis are usually contraindications to the use of these new arsenic preparations, although in both the first two mentioned groups there will be found many luetic patients upon whom a small dose of salvarsan may well be tried and, unless followed by untoward effects, cautiously repeated in gradually increasing doses.

2. When tuberculosis infects or becomes active in a patient with secondary, tertiary, or even latent syphilis, the careful employment of one of these drugs is also indicated.

3. The more active the tuberculosis, the smaller should be the initial dose; the slower its increase, the less frequent the interval, and the greater care and watchfulness required.

4. Tuberculin-like focal reactions may follow their administration, should be carefully watched for, and, if present, the location, intensity and character will frequently guide in the selection of the next appropriate dose or interval.

FAILING CARDIAC COMPENSATION DURING PREGNANCY.

In the *Boston Medical and Surgical Journal* of December 14, 1916, LAWRENCE asks and answers the question, "Given a patient who has had slight failure of compensation which disappears under proper treatment, what shall be done during the remainder of pregnancy?" First, the decision must be made at this point as to whether the patient may be allowed to continue pregnant, or whether the uterus must be emptied. And if the latter course be decided upon, it should be carried out at once. The physician should be in possession of enough evidence at this time to make his decision sufficiently certain to act upon, for if he hesitates further, he is likely to encounter conditions which make waiting and interference alike extremely hazardous.

If the patient has had a previous break in compensation or numerous small periods of subefficiency of the circulation, or if with mitral stenosis the latter only have occurred

frequently, it is the writer's belief that pregnancy should be allowed to continue for one reason only—that the patient, in full knowledge of the risk she runs, refuses the chance to forego bearing a child. Under such conditions, sudden death or chronic invalidism are too often the result of allowing pregnancy to continue to justify the physician in advising it.

If the patient elects to run the risk, what can be done in the way of treatment? Education in sparing herself all the strain she possibly can will do much. Some writers believe that too much emphasis should not be laid on the patient's condition, arguing that in such cases optimism is a great asset. With the latter idea the writer thoroughly agrees, but optimism should be based upon the patient's ability and willingness to give herself every chance and not upon the hope that she may pull through somehow. "It is a condition that confronts us, not a theory."

Should such a patient be given digitalis more or less continually? The writer's experience with ambulatory heart cases convinces him she should. Although digitalis is said to be indicated only in broken cardiac compensation, there are in every out-patient medical clinic numerous patients whose compensation remains sufficient only so long as they take digitalis, and fails when they cease to do so. Its continued use does not provoke tolerance. There are on record at the Massachusetts General Hospital patients who have taken it practically continually for five years without harm or decreased effect. If in the latter months of pregnancy the right side of the heart is continuously dilated, and if the patient has superimposed on that condition a mitral lesion, digitalis logically should be of benefit. It is not necessary to give it daily, for, owing to its prolonged action, the patient may be kept under its influence by taking it, for example, five days a week during three weeks a month. Such a régime will often make the patient much more comfortable and will diminish rather than increase the work the heart does. Furthermore it tends to prevent the accumulation of fluid in the abdomen and pelvic organs. The absence of demonstrable edema on the surface is not proof that it does not exist in the internal organs, to complicate operation and increase danger of infection if pregnancy be terminated, as it often is in such cases, by Cæsarian section.

The other alternative is that which would be chosen for the non-pregnant patient—rest in bed so long as compensation cannot be maintained without the aid of drugs. Pregnancy, and impending labor, however, introduce the certainty that this rest cannot be continued indefinitely, and may be suddenly terminated by the extraordinary demand of labor upon the heart. In preparing for this demand, it seems more logical and actually gives better results if the patient's general muscular tone, and particularly that of her cardiac muscle, be given the benefit of a moderate exercise, even though this régime requires the administration of some digitalis. Eliminating all exercise tends to produce muscular weakness and constipation, and is not the logical way to prepare the heart for the extreme effort of labor. That this is true practically as well as theoretically is shown by the results in such cases. Too often the heart, compensated for rest, is entirely unable to meet the demands of labor, even though that event be made as short and easy as possible. The writer believes, therefore, that it is wiser to treat the patient as an ambulatory case, guarding against decompensation by giving digitalis as described above, so long as the drug does not upset the stomach.

This latter condition cannot be too carefully guarded against. Abdominal or even gastric distention has more than once been sufficient to change the condition of the heart from good to fair, or from fair to poor compensation. The elimination of carbohydrates and the division of the necessary amount of food into six small meals often add greatly to the comfort of a patient with slight cardiac inefficiency.

If digitalis is given, as suggested, any emergency arising during the period of its omission can be met by intravenous medica-

tion—a method which should be used more often in cardiac emergencies.

In mitral lesions these emergencies are usually due to acute dilatation, mainly of the right side of the heart. Such a condition demands vigorous treatment, directed along two lines—first, the reduction of the load the right side is carrying; and second, stimulation of the heart muscle. To meet the first indication, venesection is by far the most satisfactory maneuver at our command. The writer has used it in twenty cases, has repeated it several times in several patients, and on the basis of this experience believes that it acts more promptly, more surely, and more thoroughly than any medication. The amount of blood removed can be accurately controlled, and the bleeding stopped instantly if necessary. In emergency it can be performed in less time than it takes to give a hypodermic injection.

In obstetrics the objection may be raised against it that the patient, if labor ensues promptly, will lose still more blood, and that it is therefore unwise to deprive her of any beforehand. Venesection, however, may make all the difference between life and death. The amount of blood it is necessary to withdraw materially to benefit the heart is usually not over ten or twelve ounces. And with transfusion reduced to its present simple technique an equal amount of blood may be quickly introduced into the circulation. Venesection should not be withheld in the presence of acute cardiac dilatation from the fear of subsequent loss of blood.

For the stimulation of the myocardium, digipuratum intravenously, or if the patient is free from digitalis, strophanthin intravenously, has given the best results in the writer's hands. The latter has caused no bad effects when given to patients not under the influence of digitalis.

In spite of the greatest care in deciding which patients can go through pregnancy handicapped by cardiac disease, and in regulating their lives with regard to that handicap, there will be unavoidable catastrophes. Pregnancy and imperfect cardiac compensation are incompatibles, and their coexistence constitutes always a grave menace to the patient. One or the other must be eliminated; either good compensation must be maintained under ambulatory conditions, or pregnancy must be terminated. And if the patient's life is to be saved, the decision must be reached before the latter method of meeting the situation becomes too hazardous.

THE ETIOLOGY OF PELLAGRA: A CONSIDERATION OF VITAMINE DEFICIENCY.

Wood in the *American Journal of the Medical Sciences* for December, 1916, points out that it is obvious that vitamine deficiency of the grain food may be replaced by an abundant protein diet of fresh lean meat, fresh milk, eggs, and various other expensive foods. It is also obvious that an infant may be protected from scurvy while on a faulty diet by giving such an antiscorbutic as orange juice. But is there justification for such a procedure? With the gradually increasing cost of foods of the vitamine-supplying type, the poor whites of the South are no nearer their salvation from this great scourge. Lombroso once said that it would be equally as effective to advise his patients to be rich as to advise the diet needed, and if the patient were rich he would not have to be advised about the diet, for his natural desires would protect him from the disease. If decortication of grain and faulty methods of cooking cause the disease, the remedy is not beyond the reach of the poorest pellagrin. And this is Wood's experience. It is, of course, granted that the high protein diet is most desirable, but the practical solution of the pellagra problem in the South calls for some other remedy. It can be easily shown that people live without meat, milk, eggs, and other expensive protein, and still do not suffer from pellagra. Wood's experience is that such people do not eat decorticated grains. He has also learned that the response from feeding pellagrins the decorticated portions of the grain is more prompt

than when the diet is meat and eggs. It is to be hoped that the vitamine preparation of A. Seidel, which is prepared from brewer's yeast, using Lloyd's reagent, will be an inexpensive source of making up the deficit in the diet of the pellagra class. He has had no opportunity to test it in the treatment of the disease.

It would appear that pellagra is readily prevented; that the prevention does not require any increased cost of living; that the use of whole grains that have not undergone destructive changes and the avoidance of alkaline rising agents would entirely eradicate the disease.

INTESTINAL AUTOINTOXICATION.

The *American Journal of the Medical Sciences* for December, 1916, contains the report of cases of this type by BROWN.

The striking features of one case were (1) the apparently definite connection between the acute intestinal disturbances and the "eye-aches" of the patient, ophthalmoscopically recognized as acute attacks of choroiditis; (2) the fact that with these attacks the stools were always alkaline, while bacteriologically there appeared as the predominant microbes three Gram-negative anaerobes which he was unable to definitely identify, notably a large diplococcus, these anaerobes usually being practically absent when the stool was acid, while the diplococcus was isolated in pure culture from the appendix at the time of an appendicostomy operation performed later; (3) the extreme difficulty in keeping the stool acid even with a meat-free carbohydrate-rich diet, and enormous doses of an acid-forming bacillus —the bacillus bulgaricus; (4) the considerable improvement brought about by a low protein diet, which was markedly increased by an appendicostomy with colonic irrigation through the new opening; (5) the ability to prophesy the choroidal attacks from the alkalinity of the stool and its large content in certain anaerobic bacteria.

When Brown speaks of toxic symptoms he is unquestionably treading on debatable ground, and yet certain of the symptoms met with in these cases are explicable only on this basis. What is the cause of these toxic symptoms? Is it a toxin normally present or in excess? Has the protective mechanism become insufficient, possibly due to repeated mild anaphylactic reactions, or is there a tendency toward an overgrowth of certain bacteria, notably proteolytic anaerobes, and may immunity be brought about in time? Whether these toxins are derivatives of the amino-acids we cannot say, but it is striking what slight changes in molecular constitution are necessary to convert the normal bases into products of great toxicity, and it is certainly possible that this may be brought about by the proteolytic intestinal bacteria. The work of Eppinger and Guttman in isolating two ptomaines from the stool, one producing urticaria, the other asthma, is extremely suggestive in this connection. Whether these toxic anaerobes are always present in minimal amount or whether they originate from external sources, such as tainted meat or pyorrheal pockets, has not been determined. That these poisons, produced by these bacteria or due to other causes, cannot often be demonstrated is not so much a proof of their absence as of their extreme complexity, and of the minimal amounts in which they must be present in urine, blood, and stool. The mechanical and surgical conceptions of intestinal stasis are quite insufficient to explain the symptom-complex presented. Back of the mechanics of digestion lies a problem far more complicated, far more difficult to solve, the problem of congenital or acquired hypersensibility to certain stimuli, the question of the overproduction of certain toxic substances, their chemical nature, and their possible specificity, and various questions involving more definitely physical factors, notably absorption and osmosis.

In the series it is hard to escape the conclusion that in the intestine certain substances are produced which in some instances are possessed of specific action associated with a hypersensitiveness to certain proteins not in themselves toxic but possibly capable of producing a reaction

because of an acquired hypersensibility, and that therapeutically a marked improvement in symptoms and even a complete cure may be brought about by the elimination of these substances from the dietary. It is also suggested by a study of these cases that by giving these foods in gradually increasing amounts a marked increase in resistance may be produced. That in certain cases at least the symptoms are better explained on the basis of a bacterial infection of intestinal origin rather than upon that of a toxemia, and that in various cutaneous lesions, testing the cutaneous sensibility by intradermal injection of various proteins is of real value in determining whether or not the condition may be due to certain toxic bases of intestinal origin derived from the decomposition of certain protein foods. These reactions are apparently specific in character—that is, are only found to be present when the toxins produced have a specific effect upon the skin—and therefore these tests of cutaneous hypersensitiveness to various proteins probably cannot be used as criteria of other conditions best interpreted as protein intoxications with manifestations elsewhere than in the skin.

A STUDY OF THE TOPOGRAPHY OF THE PULMONARY FISSURES AND LOBES IN INFANTS WITH SPECIAL REFERENCE TO THORACENTESIS.

In the *American Journal of Diseases of Children* for December, 1916, GITTINGS, FETTEROLF, and MITCHELL reach these conclusions:

1. The fissures of the lung in infancy show practically the same relation to the bony framework of the chest as they do in adults.

2. The origin, course, and termination of the fissures vary greatly in different individuals.

3. The variations apparently do not depend on any of the anatomic characteristics of the chest and cannot be predicted therefrom.

4. The lower level of the lungs in infants and probably in young children does not extend quite as low as in adults.

5. For this reason, and owing to the anatomic characteristics of the bases of the pleural cavities in early life, great care should be exercised to avoid damage to the diaphragm in performing thoracentesis.

6. The sixth interspace in the midthoracic line and the seventh or possibly the eighth interspace in the line of the angle of the scapula (at rest) represents the lowest limits of absolute safety for thoracentesis in early life. [This is the important point to bear in mind.—ED.]

HEART FAILURE DURING OPERATION TREATED BY CARDIAC MASSAGE.

Mr. W. M. MOLLISON, in the *Lancet* of November 25, 1916, reports a case of heart failure during an operation for the removal of tonsils and adenoids treated by heart massage through an abdominal incision, and recovery. The patient, a boy aged six years, was subject to asthma, but otherwise was normal. The C. E. mixture was taken from an open mask and light anesthesia reached in an ordinary manner, after which the left tonsil was removed. There was slight struggling during the removal of the right tonsil, after which the boy was turned onto the left side and the adenoids were curetted; during this there was no movement. Immediately after it was obvious that the boy had collapsed, with dilated pupils, absent corneal reflex, and no respiration. After all local and general restorative means, artificial respiration, injection of pituitrin into the heart through the chest wall, etc., had failed, the abdomen was opened and a hand inserted between the liver and diaphragm. The heart was easily felt and no trace of movement detected in it. It was massaged at the rate of about 90 pressures a minute. Respiratory movements began and continued intermittently; the color improved and the pupils diminished. The heart, however, did not contract. Pituitrin (1 Cc.) was injected into the heart; massage was renewed, and after

about 20 squeezes the heart began to beat strongly. The abdomen was closed and the patient was removed to bed, where saline was infused. After an hour he became restless, with choreic movements of the limbs. For seven days he was more or less unconscious, with rigidity of limbs or choreic movements, a frequent shrill cry, and incontinence of feces and of urine. At one time there was violence and tearing of the bedclothes. There were, in fact, symptoms of severe cerebral irritation, due presumably to the damage done to the brain during the cessation of circulation. At the end of fourteen days there was much improvement, and eventually the boy left the hospital well at the end of six weeks. Mr. Mollison gave a résumé of previously recorded similar cases, and concluded that probably heart massage should not be postponed longer than five minutes after apparent stoppage.

THE DANGERS AND COMPLICATIONS OF TONSILLECTOMY.

In the *Medical Record* of December 2, 1916, MOORE writes forcefully upon this topic. He puts his views in these well-chosen words:

1. The remarkable number, regardless of its popularity, of fatalities and complications following tonsillectomy is astounding.

2. Thousands of unnecessary amygdalectomies are being performed yearly. A great many are being done on meager theoretical conclusions, the latter not being borne out by fact.

3. Tonsillectomies, being major operations, should be done in hospitals, and the operator should be a specialist, experienced in this work. Menges says that three days in a hospital should be the shortest stay demanded of them.

4. Hospital interns should be instructed in the control of postoperative hemorrhage. The use of the compressor, cautery, artery forceps, ligature, suture of the pillars, and the employment of adrenalin and silver nitrate, should be explained to them.

5. Unless absolutely necessary, operations at the home, dispensary, and the physician's office should be abandoned. Sepsis and hemorrhage are too frequent complications.

6. All patients and parents should be informed that there are possible dangers and complications following removal of the tonsils.

7. Levy says that in all cases the surgeon should make sure before operation that there has been no recent case of illness in the house.

8. Cocaine and adrenalin injections should not be made into the soft tissue surrounding the tonsils. Such a procedure is dangerous (Sheedy).

9. Singers should be informed that tonsillectomy may injure the voice.

10. When possible, a pathological examination should be made of all tonsils removed. Many will probably be found to be normal.

11. Conclusions as to tonsillary hypertrophy should not be made immediately after an attack of acute tonsillitis. Inflammatory enlargement may subside several months later (Still), and operative interference may be unnecessary (Layton).

12. The tonsils should be viewed as normal and not guilty until proved abnormal and guilty. The standard of surgical interference should be the avoidance of operation when possible, instead of razeeing the tonsils out on the slightest pretext. Intelligent surgeons are now preserving tissue as much as possible, as the prepuce, ovaries, tubes, chronically inflamed appendices, gall-bladders, inferior turbinates, and, in military surgery, the limbs.

13. The conservative laryngologist should always be the one to judge of the local condition of the tonsil. Physicians in general, unless they have been especially trained in nose and throat work, will not have had sufficient experience to pass on the pathology of the tonsil. The laryngologist would be wise, however, to consult an experienced internist, who has medical equipoise, when the question of tonsillitis in reference to constitutional diseases presents itself for decision.

14. Still's indications for tonsillectomy

are sound. Mere uncomplicated tonsillar hypertrophy does not call for operation. Practically complete tonsillar involution takes place in the majority of children about the age of puberty.

15. Take a nose and throat culture in all cases before operation, as the patient may be a carrier, as diphtheria has occurred immediately following tonsillectomy, even in cases in which only a throat culture was taken and found negative, the culture from the nose being neglected.

16. In all cases test the coagulation time of the blood. Perform no operation on any one when the clotting time registers beyond one minute and a half. Thrombokinase, as used at the Manhattan Eye and Ear Hospital, which acts on the fibrin ferment of the blood and forms a clot, is useful in controlling oozing. Also in these cases of delayed clotting time administer calcium lactate for several weeks prior to the operation and then test the clotting time of the blood. Use calcium lactate especially in cases of the lymphatic type. Wilson has proved by the coagulometer that the blood-clotting time in adults can be reduced from seven minutes to one minute after the administration of 120 grains of calcium lactate. Fonio's "separierende methode" determines which of the elements of the blood is lacking in the individual case. Fonio's "'coagulen" (blood platelets) is a valuable hemostatic. Horse or rabbit serum can be tried. Hess uses "tissue extract" as a hemostatic, applying it locally in cases of hemophilia. It has been used after tonsillectomy. The injection of human blood or serum, preferably familial, or diphtheria antitoxin, can be employed. Transfusion, by the multiple syringe method, may be used.

17. It appears to be a good plan to test the bleeding time of blood by Duke's blotting-paper method. The bleeding point is independent of the coagulation time, so that it may be normal in a case of jaundice, in which the coagulation time is very much delayed, or in a case of hemophilia. If the platelet count is diminished, then a delayed bleeding time indicates a hemorrhagic diathesis. Normally it is one to three minutes. It is delayed where the platelet count or the fibrinogen content of the blood, either occurring separately or at the same time, is excessively reduced. Constitutional purpura is characterized by prolonged bleeding time with normal coagulation time.

18. Ligate and stop all bleeding points after tonsillectomy, as in all other surgical procedures. Thompson's test, keeping the child on its side near the edge of the table, the foot of the latter being elevated, is a good one. Any bleeding comes out of the mouth and is discoverable.

19. Avoid shock by using ether in most cases. The effect of ether is exerted wholly through its action on the suprarenals. Coagulation processes are hastened by ether anesthesia.

20. The wisdom of the prophylactic removal of tonsils appears to be very questionable. Results thus far by competent observers have not justified the indications in most cases.

21. Operate on no patient with an elevated temperature, as the patient may be in the incubation stage of measles, scarlet fever, or diphtheria (Layton). Richardson, however, reports a subacute case in which, after the patient had been running an elevated temperature for several months, the fever disappeared following a tonsillectomy.

22. Operate in no case in which the constitutional or local condition is acute, as in arthritis, neuritis, coryza, tonsillitis, habit spasm (Still), or when the patient is still convalescing from influenza. The reaction may be worse than the presence of the tonsils.

23. If avoidable, never operate in the winter months. Bronchitis is more apt to follow such a procedure (Still). Layton of Guy's Hospital performs no operation on the out-patients during the winter.

24. Perhaps it would be a good plan for laryngologists to take up the question again of the local treatment of chronic tonsillitis and tonsillotomy. Pybus says, where the symptoms are only mechanical, partial removal may suffice. Comroe expresses the

hope that many tonsils may be rescued from unnecessary and undeserved slaughter.

25. The snare or dissection method (Balfour) probably surpasses any guillotine method. Finger dissection helps to avoid severe hemorrhage (Richardson).

26. When the diphtheria bacillus, in carriers, is once lodged in the tonsillary recesses, causing repeated attacks of diphtheria, it is difficult to get rid of; the tonsils should then be enucleated (Pybus). Malignancy is, of course, an indication for their removal.

27. The "follow-up" system of recording results should be instituted wherever possible.

28. More attention should be paid to oral asepsis, before and after tonsillectomy. Treat diseased gums and carious teeth prior to the operation. No abdonimal surgeon would operate for chronic appendicitis with a furuncle in his line of incision.

29. Inquire into the history of jaundice, hemophilia, purpura, erythremia, the anemias, and diabetes before operating. Hemophilia is rarely dangerous after the twenty-fifth year. As the skin and cellular tissue in diabetics are readily invaded by the microbes of suppuration, and as the multiplication of these microbes is singularly favored by the presence of sugar in the tissues (Bujvid), it would appear unwise to perform tonsillectomy upon a diabetic. Those suffering from diabetes stand all operative procedures badly.

30. Look for other foci besides the tonsils, and other etiological factors, and then try generally accepted treatment for the various chronic systemic diseases, before attacking the tonsils.

31. Tonsillar inflammation in those subject to occasional attacks of tonsillitis becomes more infrequent and may disappear altogether when middle age is reached.

32. Tonsillectomy for arteriosclerosis and heart disease, in the light of our present knowledge, is absolutely unjustifiable. Sclerosed arteries retract and contract with difficulty, and severe hemorrhage is frequent in these cases and difficult to control.

33. Tincture of iodine (Marquis) applied to the tonsillar fossæ after the operation, throat gargles, and compound tincture of benzoin, when used in the postoperative period, are useful applications to be made to help the disagreeable postoperative condition.

34. Perhaps the postoperative sloughing can account for some of the sequential systemic reactions in joints and other tissues. Systemic absorption of toxins is the rule from acute septic areas.

DIAGNOSIS AND GENERAL TREATMENT OF SYPHILIS.

FORDYCE (*American Journal of the Medical Sciences,* October, 1916) concludes a careful study of this subject as follows:

The fate of the syphilitic individual depends upon the early diagnosis of his infection and the intensity with which treatment is carried out in the first six months. In the accomplishment of this purpose the modern aids to diagnosis have rendered great service. The dark-field illumination furnishes a valuable means of corroboration in all suspicious genital sores and assists in determining the nature of extragenital lesions which may simulate chancre. It should be employed in every case of chancroid to confirm or rule out the possible coincident infection with the treponema pallidum.

The Wassermann test fills a large field of usefulness not only as a diagnostic medium but as a guide to the effect of treatment and criterion of cure. It is of special value in all conditions of obscure etiology referable to the cardiovascular system, cerebrospinal system, or viscera in which syphilis might be a factor, and in cases with an indefinite clinical picture, such as neurasthenia, febrile attacks, rheumatic pains, etc. Its interpretation is of great importance and requires as much training and experience on the part of the practitioner as does the interpretation of the physical signs.

The examination of the spinal fluid enables us to determine the activity of the luetic process in the brain or cord, to distinguish the various pathological types affecting the central nervous system, and in

many cases to differentiate between these and non-syphilitic affections. Recent investigations have shown that an analysis of the spinal fluid is not complete unless the Lange or colloidal gold test is performed in addition to the Wassermann reaction and a cytological and chemical examination. Its chief usefulness lies in distinguishing true paresis from types of cerebrospinal syphilis which simulate it, and in diagnosing incipient cases before the clinical syndrome is established. This affects chiefly the prognosis, as our main hope lies in the early diagnosis and treatment of these cases, for when degenerative stigmata are already present the outlook is not so encouraging, for sooner or later relapses occur.

In primary syphilis where the spirochetes are demonstrated and the Wassermann reaction is negative it is possible to cure syphilis with salvarsan alone. It cannot be determined how many doses are required, and as there may be a dissemination of spirochetes even in the presence of negative Wassermann reaction it is better, therefore, to err on the side of safety and to give at least eight to ten doses and follow this with mercury for perhaps six months.

In secondary syphilis when the early rash is present and the Wassermann positive, it is better to precede the salvarsan with several injections of a mercurial salt, preferably a soluble one, on account of the economy of time. In this way an effect is produced on the spirochetes, and when salvarsan is given the temperature reaction and an intensification of the rash—that is, a Herxheimer reaction—can be avoided. After the salvarsan is begun the treatment is to be continued in the manner outlined in the body of the article. The dermatologist and syphilologist should keep in mind the possibility of the involvement of the nervous system in secondary syphilis, and a complete study should be made when the patient comes under observation so that this record can be compared with any subsequent developments. In this way we are often enabled to detect the very earliest changes which manifest themselves objectively in the nervous system. The most frequent are irregularity of the pupils, persistent headache, and optic neuritis, or auditory disturbance.

In latent syphilis with a positive Wassermann reaction an investigation should be made of the cardiovascular and of the nervous systems, or of previous involvement of any of the viscera, as, for instance, syphilitic hepatitis. In cardiovascular syphilis the prolonged use of mercury in connection with potassium iodide is probably of more value than the haphazard use of occasional doses of salvarsan. In other words, in tertiary syphilis with a persistent positive Wassermann reaction without involvement of the central nervous system the beneficial effects of potassium iodide cannot be too strongly insisted upon. In bone and periosteal lesions attended by severe pain there is no drug in the Pharmacopœia that produces so rapid an effect in relieving the pain and reducing the neoplasm.

The criteria of cure are a negative Wassermann reaction for at least a year, continuing so after a provocative injection of salvarsan, and a normal spinal fluid, with the exceptions which have been noted.

Swift holds that no case should be released from treatment until the cerebrospinal fluid has been shown to be normal in so far as pleocytosis and Wassermann reaction are concerned. A fair proportion of patients with syphilis are still poorly treated, and the majority of them are released without lumbar puncture. The value and interpretation of laboratory methods should always be based on the most careful study of the case in which it is applied. Any normal reaction in the cerebrospinal fluid may be present or absent in any luetic involvement of the brain or spinal cord. An increase of globulin is found in most cases of any type, but is most marked in paresis, although it may be equally intense in secondary meningitis. Pleocytosis is usually the most intense in meningitis in the secondary stage, but counts above 100 are not infrequent in later cerebrospinal syphilis, tabes, and paresis. The type of curve given by the Lange gold reaction in cerebrospinal lues and tabes is of confirmatory value, but

its great field of usefulness seems to be in differentiating paralytica dementia from these two conditions. The fact that the fluid from a patient with a clinical diagnosis of tabes, or cerebrospinal syphilis, gives a paretic curve does not militate against the reaction, for it is well known that between 10 and 15 per cent of tabetics develop paresis, and at times it is impossible to differentiate between cerebral syphilis and paresis. If future observations confirm what now seems probable, namely, that a paretic curve obtained with the spinal fluid of patients clinically not paretic points to a possible development of this disease, it will be of importance in prognosis and of value in determining why symptoms of mental disorder appear in spite of vigorous and prolonged treatment.

A PLEA FOR THE TABETIC.

GROSSMAN (*Interstate Medical Journal*, November, 1914) under this title contributes an article serviceable from its comprehensive brevity and sound common sense. He lucidly explains the reason for this class of sufferers falling readily into the hands of irregular practitioners. It is because of the common tendency of the American profession when they diagnose a case of lumbar ataxia to give prompt and unfavorable prognosis and to dismiss the patient with a few words of gloomy advice and perfunctory pity. Such a patient is subject to tremendous influence through his psychic state, and hence may be benefited and greatly benefited by one or many forms of treatment which in themselves have little or no effect. Moreover such treatment may come at a time when the patient is subject to one of those remissions so common in all chronic infections. Nor can it be doubted that the ablation of the toxic focus is at times so markedly helpful to the tabetic as to amount almost to a cure. The treatment considered is first that directed against the apparent cause of the disease, and second, that directed against its symptoms. Medicinal treatment directed against any active luetic process, the combined use of salvarsan intravenously and the salicylate of mercury intramuscularly, has proved to be the method giving the best results; 0.2 to 0.4 grm. of salvarsan should be injected intravenously at intervals of from seven to ten days for six injections; in the intervals injections of mercury may be given, they being continued for ten weeks after stopping the salvarsan. The salicylate is given in doses of one-half to one grain twice a week. After one month's rest the same process should be repeated until the activity of the disease as indicated clinically and by biological reaction is arrested. Intraspinal injections of mercurials and salvarsanized serum seemed to be distinctly serviceable, though it has been shown that the spinal fluid twenty-four hours after the intravenous injection of salvarsan contains more arsenic than it does immediately or shortly after the injection of the so-called salvarsanized serum. In the dose of the latter but 0.0001 grm. of salvarsan is found.

As to symptomatic treatment, pain is one of the most common and distressing symptoms of tabes. It may last minutes, hours, or days, and may be of almost unbearable intensity. It is usually in evidence when there is excessive humidity in the air or lowered barometric state. Local measures should be used, such as dry heat, cauterization, massage, tight bandages, etc. Aspirin, antipyrin, salicylate of soda, and codeine are the most efficient of the milder drugs. As a last resort morphine may be needful. It should be used with extreme caution and as a rule without the knowledge of the patient. Bladder disturbances, which occur in about 80 per cent of cases and which consist of dysuria, hyperesthesia of the neck of the bladder, followed by frequent micturition, dribbling, and various degrees of retention, may be helped by strychnine and ergot in small doses. Of the utmost importance is the training derived from emptying the bladder at short intervals, at most every four hours. A danger that must not be underestimated is that of infection. A catheter must be used in a thoroughly cleanly manner. The ataxia present in about 75 per cent of the cases begins

insidiously in the lower extremities, often by tiredness and unsteadiness, with a tendency to stumble easily, especially in the dark. Frenkel elaborated a system of exercises so designed as to reëducate the ataxic muscles by a graded coördinated movement. The patient is trained at first to stand and to use his eyesight to compensate for the loss of his joint and muscle sense. Simple training movements are then added, such as touching with the toe a figure marked upon the floor, later walking movements in which the patient attempts to follow accurately a series of footprints, marked at various distances upon the floor. Later walking movements in which the patient attempts to follow accurately a snake-like course, turning, etc. Finally walking up and down stairs is taught. There are few patients who have not improved to some extent, and a few are so much better that they can walk unattended in public. Relapses are common. Maloney's method is based upon first the teaching of coördinated movements blindfolded; second, the correction of the mechanical defects usually found in all tabetic feet; third, the treatment and elimination of the psychic components of ataxia, the principal one of which is fear.

Maloney's method is thus applied: Mechanical measures; these consist of plates, shoes, and knee-caps, by means of which we endeavor to correct any mechanical disabilities present. Casts of the foot at rest and when bearing the body weight are taken, and a suitable plate to correct defects of the arches is constructed therefrom. The type of plate used is a modification of the Whitman plate, the inner lip being curved below the level of the scaphoid; the outer flange is lower and does not extend so far forward; and the support of the transverse arch extends outward beneath the four inner toes. When the spread is great, the inner lip extends forward to include the metatarsophalangeal joint, surrounding it completely on the inner side.

A high shoe, especially strengthened on the outer side of the ankle, increases the support of the ankle and prevents the foot from turning in. The heel is low and wedge-shaped, the base of the wedge being on the ground, and is continued along the outer side of the shoe. A welt, as broad as the patient will permit (usually about a quarter of an inch), projects. A wooden shank is placed in the sole to prevent bending. The shoe should be as light as is consistent with maintaining its shape. When the shoe is on the ground, it rests on its whole bearing surface. The patient gets support from this broadened surface simultaneously. He does not oscillate every time he puts his foot down. He feels more secure; he really is more secure. He is readily weaned from the straddle-legged attitude, which is so disconcerting to coördinated walking. The occasional giving at the knees has a very demoralizing effect upon the ataxics. To avoid this giving, the knees should be lightly supported by an elastic bandage.

The educational exercises are coördinated movements and balancing. The breathing exercises are carried out by putting the patient blindfolded upon a bed, directing him to inspire deeply, using his diaphragm and restricting his thoracic movements. At the height of inspiration he is asked to pause, then slowly and evenly to expire to the fullest extent and again pause. A small sand-bag is placed upon the abdomen. After six or eight deep breaths have been taken the patient is asked to take about the same number, but not quite so deep, shortening the pause, then slowly and evenly to expire to the fullest extent and again pause. After this medium breathing is mastered, the depth of the respirations is further decreased, and the pause is shortened until the patient is breathing quietly and regularly as if asleep.

To relax the muscles, passive movements in which the muscles are alternately lengthened and shortened are employed. The muscles of the scalp, forehead, eyelids, cheek, and jaw are first passively moved until wrinkling and blinking of the eyelids diminish and disappear and muscular spasm is reduced or eliminated. Next the shoulder

is relaxed, then an arm; each in turn must be passively moved until all traces of muscular tension vanish and the part lies motionless and flaccid, and falls limply from any unsupported position.

From these relaxation exercises, practiced blindfolded, three results are obtained: First, ineffective, often useless and sometimes completely disconcerting muscular contractions which have been acquired in attempts to balance are eliminated, so that the coördinating exercises can be begun on an unconstrained musculature and not superimposed upon existing habit contractions. Second, active relaxation confers a great training in attending to muscular sense impressions. Third, the patient becomes less fearful and more receptive, because in so far as fear is maintained by its motor expressions in his attitude, it is diminished.

Movements are next begun. Passive flexion and extension of the ankles are first practiced. The foot is placed in extreme flexion, and the patient is instructed to count slowly while the physician, at a uniform rate, moves the foot to a position of complete extension. The purpose of the passive movements is to teach the correct direction and extent of each movement.

Next the patient lightly but steadily resists the passive movement. Then the movement is practiced, with the patient performing and the physician aiding and guiding. The physician's aid is gradually lessened as improvement occurs, and then the movement is executed by the patient alone; finally, the movement is made against resistance. It is essential that the movement should always be completed by the return of the limb to the position from which the movement started. During every movement the patient counts rhythmically. The purpose of the counting is to educate the patient to move easily and uniformly, and at a regular tempo. After the ankle, first the knee, then the hip of the same limb are educated. Besides flexion and extension, all the simple movements which can take place at the joint are practiced. All exercises are done without shoes; artificial aid should not be employed during the exercises. In every case, first breathing and relaxation, next passive, then passive resistance, then passive combined with active, then active unaided, and finally active resisted movements are practiced.

When the ankle movements have been acquired, then movement exercises are begun with the knee; when the knee movements have also been acquired, then ankle and knee movements are repeated before each attempt at hip movement, etc.

The repetition, after relaxation exercises, of a movement which can be proficiently performed, is a great aid in the learning of the next movement. The limb movements which are practiced in the recumbent posture may also, if possible, be practiced as occasion permits in the sitting posture. From the right lower limb we proceed to the left, breathing and relaxation; passive, resisted passive, combined passive and active, active and active resisted movements at each point are practiced as before. Before any attempt is made to teach progression, the trunk muscles must first be coördinated by relaxation and movement. This is usually easy, for the upper limbs seldom being ataxic may be used to practice lateral and forward thrusts, elevation to a sitting and resumption of the recumbent posture, with aid and against resistance. The head and neck muscles are similarly treated. Their treatment is just as important as that of any other part. The position of the head largely governs the attitude of the body. Too great stress cannot be laid on this preliminary training and attitude. The whole body must be taught to move harmoniously.

The first essential of stability in walking is stability at rest. After the exercises in recumbent and sitting postures are completed, the first attempt at progression is made. Knee-caps similar to those used by carpenters, but well padded, are tied on the knees and the patient is instructed in creeping. The change from recumbent to creeping posture does not unduly strain the patient's confidence in his powers of unaided blindfolded progression. The creep-

ing movements are conducted with the back as horizontal as possible; squatting must not be permitted. The tempo of the movement is again carefully regulated by counting. The direction is insured by means of a strip of carpet or linoleum upon which the creeping is performed.

After creeping has been practiced for some time, first changing from creeping posture to kneeling up, then rising from the sitting posture to the upright, are attempted. In the erect kneeling posture, progression is practiced. Progression in the creeping and kneeling postures trains a person to move his body automatically with his lower limbs.

This training is invaluable as an aid to walking. Finally walking is taught. To maintain direction during blindfolded walking, strips of carpet or linoleum are again used.

These strips may be arranged parallel with the walls of the room, so that the patient may at first feel his way. As he becomes more proficient, narrower strips are used until he is able to progress on a strip five inches wide. Relaxation should be as zealously practiced as are the movements, as in the beginning the education of muscular sense impressions must come mainly through these exercises reënforced by blindfolding and passive movement. The patient should be exhorted not only to relax daily at definite periods, but also to avail himself of every opportunity of relaxation. Every movement must be performed without strain. When during the exercises the performance is unsatisfactory, the indication is relaxation. At no time should the patient be allowed to become fatigued.

SYPHILITIC DISEASES OF THE EAR.

FRASER (*Edinburgh Medical Journal,* July, 1916) exhaustively reviews the importance of congenital syphilis as a cause of acquired deafness, it ranking after cerebrospinal meningitis and middle-ear suppuration; it is probably also causing many cases of "congenital" deaf-mutism. Estimates of the frequency of deafness in children with this disease range from 33 to 60 per cent. In the secondary and tertiary stages of the acquired form of the disease sudden and severe deafness is of frequent occurrence.

In congenital syphilitic infants the lesions found are otitis media, sometimes with involvement of the labyrinth, delayed ossification of the petrous bone with abnormal marrow spaces; intrauterine meningitis and neuritis of the eighth nerve, changes in the blood-vessels, hemorrhages in the middle and inner ear, and changes in Corti's organ and in other parts of the labyrinth. Spirochetes have been demonstrated in a seven-months' fetus in the cochlear and vestibular nerves, and also in the facial nerve and in the tympanic and carotid plexuses.

In young children who are congenitally syphilitic Eustachian catarrh and middle-ear disease run an unfavorable course. Thus syphilis is to be suspected when the clinical course is not as desired.

The late type of congenital syphilitic deafness, occurring between the seventh and thirteenth years, may be due to neurolabyrinthitis spreading from the meninges, to vascular changes (endarteritis), or to otitis media, followed by paralabyrinthitis or invasion of the labyrinth. The tympanic membranes are seldom normal in the late form of congenital syphilitic deafness. While this points to precedent attacks of otitis media, Fraser holds that in at least some cases such otitis is syphilitic.

In the late congenital form otoscopy shows a thickened membrane in about 88 per cent of cases. Bone conduction is shortened and may be absent. The upper bone limit is much reduced, and the lower bone limit is raised. In occasional cases the middle-ear type of deafness obtains.

As to the vestibular apparatus, in 24 cases examined, the reaction to rotation and cold syringing was absent in 14, reduced in 7, and normal in 4.

All of the stages of acquired syphilis have been observed in the ear. Chancre of the mouth of the Eustachian tube was formerly not infrequent from the use of infected catheters. Secondary syphilis of the

middle ear is probably much more common than is generally supposed. It may spread up the Eustachian tube from a nasopharyngitis and give rise to the symptoms and signs of catarrhal otitis media. The labyrinth too may be affected at this time. But one ear is commonly attacked. The onset of deafness is usually rapid.

In the tertiary period otitis media may not be solely due to the presence of the spirochæta, but the presence of syphilis certainly alters the course of the affection. Gummata may be present. In this stage the labyrinth is almost always involved.

It is not possible, however, at present to differentiate between labyrinthitis and affections of the eighth nerve. The prognosis of neurolabyrinthitis appears to be better in the secondary than in the tertiary stage.

In the treatment of this condition there is a strong impression among aurists that the administration of salvarsan alone is dangerous. The treatment should be started with mercury and the arsenical preparation added later. Some cases have been found to yield to salvarsan when mercury has failed, while the opposite condition has likewise been noted.

The central portion of the eighth nerve may be affected by gummata, aneurism, or scars; the peripheral portion by gummatous infiltration. Severe, often prolonged headache often precedes these conditions. Severe ear pain may occur in tabes.

Salvarsan is not as useful in ear syphilis as was at first expected; many regard it as a frequent source of trouble. It is important, as a prophylactic, to give syphilitic pregnant women careful treatment, and to give congenitally syphilitic children treatment for several years, whether or not they show symptoms of the aural disease. Inunctions and iodide should be given; Cheatle advises the addition of thyroid extract. Injections of pilocarpine and blistering are also commended. The results of treatment by the methods of Swift and Ellis and of Ogilvie are not available. The question as to whether involvement of the eighth nerve has been more frequent since the introduction of salvarsan is not settled. It seems wise to administer mercury as well in the routine treatment of the disease.

After an injection of salvarsan the auditory nerve may be affected either "early" or "late." The "early" cases occur within the first twenty-four hours, and are probably due to swelling of the nerve in a narrow bony canal, in the presence of an active syphilitic process. Vestibular disturbance is characteristic. Complete recovery is the rule. The late cases occur four to six weeks after injection. The author does not express an opinion as to whether syphilis or salvarsan is the cause of the disturbance, but sums up the evidence as follows: (1) Cases of neurolabyrinthitis were common during the stage of secondary syphilis before the days of salvarsan, and are not infrequently met with at the present time in cases in which "606" has not been employed. (2) Similar attacks are recorded during treatment by mercury and iodides. (3) Examination of the cerebrospinal fluid in cases of "nerve relapse" appears to show that the condition is due to syphilitic meningitis (Voss). When the optic nerve is affected the changes appear to be inflammatory (Schanz and Tobias). (4) Cases in which salvarsan is vigorously pushed suffer less than those who receive a single dose (Ehrlich). (5) Syphilitic affections of the inner ear may be improved by the injection of salvarsan. (6) In the early stages of syphilis an endotoxin is formed which is liable to injure the acoustic, optic, and facial nerves or their terminations (Willcutt). (7) Long interval between the injection of "606" and the appearance of the labyrinth symptom, at least in some cases.

In favor of the view that salvarsan is the cause of the ear trouble: (1) Deafness has followed the use of salvarsan in a non-syphilitic case (lichen ruber) quoted by Lange. (2) Meningitic changes occur in the cerebrospinal fluid after the injection of salvarsan, though before the injection the fluid was normal. (3) Arsenic in large doses is a nerve poison (Evely, Pogany), and the eighth nerve is a *locus minoris resistentiæ*, especially in cases in which it is already affected by syphilis. (4) Japanese

waltzing mice suffer from a congenital lesion of the vestibular nerve. Ordinary white mice, when injected with arsacetin, become waltzing mice. Subsequent microscopic examination shows degeneration of the vestibular nerves (Rothig). (5) Alexander states that he saw fewer cases of labyrinth disease in syphilis during the seven years prior to the introduction of salvarsan than in four months after its introduction. (6) Failure of further doses of salvarsan to effect a cure of the condition. (7) Analogy between the effects of atoxyl on the optic nerve and salvarsan on the auditory.

SURGICAL TREATMENT OF ACUTE EPIDIDYMITIS.

McKenna (*Surgery, Gynecology and Obstetrics,* December, 1916) concludes an article with this title as follows:

Surgical interference is necessary only when the patient is suffering excruciating pain. When this procedure is carried out, it is quite necessary to divide the fasciæ so as to free the tension from the testicle as well as from the epididymis. Patients are less apt to be impotent if the posterior wall is divided carefully and the pus drained off than if the pus is left for nature to absorb. A blind-stab operation is that of a faker and should not be considered. It is not enough to expose the epididymis and drain it; all the fasciæ should be free.

It is not necessary to split the epididymis, but only the infected chamber which stands out clearly.

AN ABDOMINAL OPERATION FOR THE CURE OF CYSTOCELE.

Du Bose (*Surgery, Gynecology and Obstetrics,* December, 1916) advises the following operation: After incising transversely the vesicouterine peritoneal fold, separation of the bladder by blunt dissection from the uterus completely and from the upper inch or more of the anterior vaginal wall is done, so that the bladder (being thoroughly mobilized) may be lifted well up and forward from these attachments. The round ligaments on each side are caught, united, and attached to the most dependent part of the vesicovaginal denudation, with a linen suture passed well into the anterior vaginal wall. Another suture or series of sutures of linen approximates the frayed or torn ends of the vesicouterine ligaments and attaches them to the anterior and upper cervical portions of the uterus as represented by the untied suture. By letting the needle bite be far out laterally to include the ends of the vesicouterine ligaments, a narrowing of the anterior vaginal wall in its long axis occurs. The slack is also taken up in the relaxed pelvic aponeurotic diaphragm. Added to this restoration is the support of the round ligament folds. If these ligaments are attenuated and there is still a doubt that the relaxation and decensus will not be overcome by these supports, then artery forceps may be forced through the broad ligaments about on a line with the internal os laterally so that the forceps will catch in the bite the loose folds of the sacrouterine ligaments and pull them through. The ends of these ligaments are then sutured together with linen, and these ends in turn sutured to the denudation on the upper cervical portion of the uterus, serving to pull upward and backward the cervix uteri, and to take up the slack in the relaxed sacrouterine folds. Successive tiers of chromic catgut sutures are placed so as to approximate the bladder on the uterus at a much higher level than its former normal attachment. Before this suture line is completed, it will be found easier to plicate with linen the round ligaments on each side, including in the suture the wall of the uterus laterally and the incised edge of the broad ligament peritoneum. This fine linen or silk suture continues until the plicated round ligament approximates its original attachment into the uterus, restoring its original point of traction on the fundus uteri. One or more catgut sutures are placed between the uterus and bladder until the former reflection of the bladder is raised to the fundus and attached by a running suture (of catgut in the fertile, linen in the sterile) along a line

running above the uterine insertion of the round ligaments. The operation is completed by a continuous suture turning in and approximating the peritoneal edges of the bladder laterally to the broad ligaments and to the fundus of the uterus above.

THE PRESENT CONCEPTION OF CONGENITAL SYPHILIS AND ITS MODERN DIAGNOSIS.

ROSTENBERG (*Medical Record*, July 1, 1916) after alluding to the now commonly accepted fact that spirochetes are carried from the mother's placenta into the fetal blood-vessels, thus establishing a condition which practically corresponds to the early secondary stage of acquired lues, refers to the experiments of Finger and Landsteiner, who have successfully inoculated monkeys with the spermatic fluid of a syphilitic man and obtained luetic manifestations, thus proving the contagiousness of syphilitic sperma, in spite of the absence of spirochetes in the spermatozoon.

Bab also found a positive Wassermann reaction in the sperma obtained from syphilitics. This may explain the cases in which a healthy mother conceives from a syphilitic father who does not show any infectious lesions anywhere; the mother without having had a primary lesion develops early secondary symptoms in the first half of her gestation; an abortion usually follows, and the fetus shows all the earmarks of congenital lues. It is generally accepted that maternal syphilis will persist in its infectivity much longer than a paternal one. Therefore we see cases in which a syphilitic woman joined in marriage to a perfectly healthy man bears him syphilitic children. Such transmissions have been observed as much as twenty years after the mother was infected. In all cases of pregnancy in which there is a positive Wassermann prompt intensive treatment is indicated. Lues should be suspected in every case of abortion or miscarriage occurring in an otherwise apparently healthy woman. Ruge in a series of 94 abortions found lues as the cause in 78. The syphilitic child born dead is usually macerated and the placenta is much larger than normal. The majority of congenital syphilitic children surviving their intrauterine infection are born with a clear skin and apparently in perfect health. Symptoms develop in the first three months; snuffles and skin eruptions are perhaps the most prominent. The Wassermann may be negative in the case of the child; it is usually positive if the mother's blood be taken.

THE IMPORTANCE OF THE PROPER DOSAGE OF SODIUM CITRATE IN BLOOD TRANSFUSION.

LEWISOHN (*Annals of Surgery*, November, 1916) concedes that sodium citrate is exceedingly toxic when introduced in large quantities into a human being. Five grammes can, however, be safely given to the adult without risking the toxic effect in 0.2-per-cent doses. This allows us to transfuse as much as 2500 Cc. of blood at a time—more than it is ever desirable to take from a donor or introduce into the recipient. Lewisohn has made 75 transfusions in 62 cases, the youngest being an infant ten days old, and has seen no sign of toxic effect in any instance. Chill has followed in 10 per cent of the cases. Lindeman gets chill in the same percentage, using unmixed blood. It is quite certain that any method will give about this percentage of chills. Nor does this chill lasting but a few minutes interfere in any way with the clinical results of transfusion. In a large series of cases which received repeated transfusions, two different methods were used—the citrate method and the Unger apparatus. Citrated blood does not show any changes from the normal blood picture. Blood mixed with sodium citrate at the rate of 0.1 per cent will clot just as quickly as normal blood. If one adds a minute amount of citrate, making the percentage 15 cgm. of citrate to 100 Cc. of blood, such mixture will stay fluid for at least two days, and it is perfectly feasible to use a 0.15-per-cent mixture for the citrate method of blood transfusion, but it would have to be made very accurately. The slightest error under 0.15 per

cent would cause rapid coagulation. For this reason the 0.2-per-cent mixture is advised.

The great majority of the reports profess perfect satisfaction with the 0.2-per-cent dose. Brem has carried citrated blood (0.2 per cent) as far as seventy miles before he injected the mixture. There is no objection to the use of a dose slightly larger than that originally indicated as long as proper care is taken that the toxic level is not reached. A large clinical experience has shown, however, that 0.2 per cent is an absolutely safe percentage. It is important that a large size needle be used in collecting the blood from the donor. Citrated blood mixes only after the blood has left the needle. The use of a cannula with narrow lumen will not permit a free flow, and the blood may clot before it mixes with the citrated solution. The correct way to obtain the proper percentage is to collect 180 Cc. with 20 Cc. of a 2-per-cent stock solution.

Weil has reported the important fact that the coagulation time of the recipient's blood is shortened after the injection of citrated blood, but soon returns to its previous level. Ottenberg has reported a case in which after injecting 150 Cc. of citrated blood (0.2 per cent) the coagulation time dropped within ten minutes from one hour and twenty minutes to seventeen minutes. After twenty-four hours the coagulation time had gone back to one hour and fifteen minutes.

GUNSHOT WOUNDS OF PERIPHERAL NERVES.

STOOKEY (*Surgery, Gynecology and Obstetrics,* December, 1916) states that with the use of high explosives and bullets with high velocity the frequency of nerve lesions has increased.

Peripheral nerves may be injured by direct violence of projectile and by the violence imparted to bits of bone or even foreign bodies.

Peripheral nerves may be implicated secondarily by scar tissue, or callus, or both.

Diagnosis cannot be made before operation between anatomical and physiological division. Diagnosis can usually be made in cases with incomplete division.

In war surgery primary suture is rarely possible, due to infection.

Exploratory operation is indicated when a diagnosis of complete division is made. Delay in operating usually means delay in return of function.

Nerve-freeing is in many cases to be preferred to excision and suture. When the nerve is widely implicated and there is a large loss of continuity, it is better to do nerve transference or nerve transplantation than tubulization or suture with the nerve under tension.

Stretching of the nerve should not be done, as it causes karyolysis of the nerve cells in the anterior horn, with subsequent degeneration of the nerve axon in the proximal nerve-trunk.

Efficient splinting to prevent contractures and overstretching of the muscles is imperative, both before and after operation.

The terms epicritic and protopathic tend to be confusing. Greater accuracy is in use of specific terms, as area of cotton-wool, area of pin-prick, areas of moderate and extreme degrees.

Musculospiral nerve injured in its lower third shows loss of sensation on a narrow band over dorsum of thumb, usually only loss to cotton-wool and temperature sense.

Injury to musculospiral nerve may cause dissociation of temperature sense in the area on the dorsum of the hand—without loss to cotton-wool.

The median nerve does not supply any skin on the dorsum of the thumb; supplies up to line in continuation of lateral borders of nail.

The anterior cutaneous division of the ulnar nerve supplies the skin in the same manner as does the median nerve—*i.e.*, on to dorsum of fifth and part of fourth, middle, and distal phalanges. The posterior cutaneous division supplies the ulnar side of the hand and the proximal phalanx of the fifth and part of the fourth.

The action of extensors assists the interossei in separating the fingers. To test for

paralysis of the interossei, have the patient bend his fingers at right angles at metacarpal phalangeal joints; prevent effort of extensors by holding the fingers across; then have the patient try to separate his fingers gently.

Return of motor function begins with the muscles which first receive their supply below the lesion. The return is earlier the nearer the lesion is to the periphery.

Trophic ulcers occur only after trauma. Their repair appears to be no different from that in other parts.

Functional disorders may be superimposed on organic peripheral nerve lesions. Usually they are readily recognized.

TREATMENT OF WOUNDS IN WAR BY MAGNESIUM SULPHATE.

Morison and Tulloch (*Journal of the Royal Army Medical Corps,* October, 1916) state that from a clinical point of view hypertonic solutions to produce their ideal results must have the following properties:

They must not be easily absorbed.

They must stimulate the growth of granulations in the whole of the wound, and these granulations must be firm, compact, and vascular.

Their application to wounds must be simple and easy, and the changing of dressings containing them infrequent and painless.

The application of magnesium sulphate fulfils these requirements. It is not absorbed, the granulations formed under it are ideal, the dressings, even in the most septic cases, need only be changed twice a day, and its use is painless. It has the additional advantage of being cheap, readily procured, and easy to handle.

In no case so treated have there been any symptoms of absorption (pain, thirst, diarrhea, rise in temperature).

Secondary abscesses and lymphatic infections have not occurred. Many patients have expressed their satisfaction as to the painlessness of the dressings.

The type of granulation produced by magnesium sulphate is such that very little absorption is possible from it. A sloughing suppurating wound is converted under it in a few days to a bright-red, flat, compact, granulating surface, which lends itself to the rapid growth of epithelium from its edges. In deeper wounds, and where the bone is injured or laid bare, a similar result may be anticipated. It is the rule that sepsis is held in check, suppuration disappears, healthy granulations soon cover the bare bone and tendons, and the amount of necrosis is diminished or even entirely prevented.

The condition of the wounds when convoys arrive from overseas demands attention. The dressings generally consist of gauze which has been moistened with some solution and covering it a quantity of cotton-wool. The wound, soon after the application of such a dressing, becomes dry from evaporation, so that difficulty is experienced and pain caused by removing the dressings which have become adherent to the wound. In the deeper wounds discharges are pent up and the condition of the patient and the wound suffer. The simplicity of application of magnesium sulphate, and the infrequent changes of dressing necessary, allows of several cases being attended to in a short time, and makes it the ideal dressing for wounds where the transport of the patient is necessary, and these deleterious results are likely to happen.

A saturated solution of the salt has given the best results, both clinically and experimentally—forty ounces of magnesium sulphate (by weight) are dissolved in ten ounces of glycerin and boiling water sufficient to make a Winchester quart (by measure). The glycerin must be added slowly while the solution is hot and stirred gently, or the salt precipitates on cooling. The solution is then sterilized in an autoclave and is ready for use.

In recent injuries the wound is freely opened up, any foreign body, bullet, portion of shell, clothing, etc., is removed, and the whole wounded surface is swabbed over with pure carbolic acid. In the case of fractures, the ends of the bone are treated in the same way, and free fragments of

bone are removed. The wound is gently packed for twenty-four hours with gauze wrung out of carbolic lotion (1 in 20) and antiseptic wool applied as an outer dressing. At the end of this time the wound is dressed, the gauze plug is removed, the wound is syringed out with magnesium sulphate solution of the strength indicated above, no swabbing of the wound is done, and the wound is loosely packed with sterile lint taken out of the magnesium sulphate solution in which it is constantly kept. The strips of lint used are narrow (from half inch to one inch wide), so that the solution with which they are saturated comes in contact with all parts of the wound surface. A double layer of lint, wet with the solution, covers the whole of the surface wound. This is covered with a piece of jaconet and then cotton-wool, the whole dressing being fixed loosely by a bandage. In the case of wounds of a later date, where sepsis and suppuration are fully established, the treatment by carbolic acid is omitted and magnesium sulphate solution is commenced at once. Dressings even in the worst cases are changed only at twelve-hour intervals, thus saving a patient much discomfort and trouble. The effect on the wound is very striking. In two or three days pus has almost disappeared, sloughs begin to separate, and the whole surface presents a bright-red color. The granulations never become flabby or edematous, but instead a firm, vascular, healing wound is seen. Scratching the surface of the wound with a probe hardly disturbs the vascular granulations. The growth of epithelium from the edges of the wound proceeds vigorously; the treatment may be continued with advantage until the entire wound is healed. The resulting scar is firm and elastic and seldom tends to contract or to become painful.

Constitutional symptoms seldom occur, probably owing to the fact that on account of the density of the granulations absorption does not take place. There is no general disturbance of health. There is an absence of lymphatic and glandular infection, and secondary abscesses have been in the authors' experience unknown.

The effect in the majority of compound fractures is very quickly manifest. Pus rapidly disappears and the amount of necrosis in comminuted cases appears, as would be expected when infection is diminished, to be materially less.

In the wards about a Winchester quart of the solution is used every day in dressing about forty cases, and the cheapness of the lotion, with the infrequent dressings required, means no inconsiderable saving of expense.

From the first series of experiments it appears that Mg_2SO_4 exhibits to a greater degree than do the other salts investigated the desirable property of interfering with the digestive activity of pus.

This statement is made with reservation as the experimental methods that one is forced to employ are open to certain criticisms, and it is suggested that the rate of epithelialization of the wounds treated would give a truer index of the property than experimental investigation does.

Magnesium sulphate has not so markedly inhibitory an action on phagocytosis as one would expect, and, therefore, even if it be absorbed to a slight extent, it would not have a deleterious influence on the process, while salt, being more readily absorbed, might well interfere with this function of the leucocytes.

Experimental work in physical chemistry and pharmacology points to magnesium sulphate as the least absorbable of the readily soluble salts, while clinical evidence—absence of pain, etc.—points in the same direction.

By virtue of the non-absorption of magnesium sulphate the granulations produced are more compact than when a more readily absorbable salt is employed.

The Mg ion has a markedly inhibitory effect on the growth of pyocyaneus. It has, however, no easily demonstrable influence in the concentrations examined, on the growth of staphylococci, or on the diphtheroids investigated.

Incorporating these conclusions in a final note one may say that it appears from the above findings that magnesium sulphate

would be the most satisfactory salt to employ for the production of "lymph lavage," and its properties indicate that it might be used satisfactorily and safely in the form of a fomentation.

Stress is laid on this last point, for if the fomentations only require renewal twice daily the dangers of manipulation are much reduced and the work of the wards is lightened.

The authors point out that they do not suggest that magnesium sulphate solutions ought to be employed for a first dressing for fresh wounds. These dressings they think should be strongly antiseptic in character, their function being prophylactic rather than curative. It was as a curative dressing in the succeeding phase that they suggest magnesium sulphate might be made use of with great advantage.

OBSERVATIONS ON ONE HUNDRED AND THIRTY-THREE CASES OF GALL-BLADDER SURGERY, WITH ESPECIAL REFERENCE TO THE POST-OPERATIVE TREATMENT.

RHODES (*Surgery, Gynecology and Obstetrics,* October, 1916) on the basis of 133 cases in which the gall-bladder was drained describes the postoperative treatment, which consists in putting the patient in bed in the prone position and giving nothing by the mouth. Proctolysis was employed, using either water, dextrose, or sodium bicarbonate, either separately or in combination as indicated, and morphia gr. ⅛ hypodermically every three hours if needful. In 77 cases the average duration of drainage was something over thirty-five days. In 56 cases it was something over twenty-nine days. In the latter series the treatment was supplemented by hexamethylenetetramine 50 to 80 grains daily. The author concludes that those having this drug have an average drainage of about a week less, that the drainage improves faster, and that the end-results are more satisfactory inasmuch as not one who was given it had any symptoms referable to the gall-bladder after leaving the hospital, as contrasted with at least four among those who did not.

TREATMENT OF GAS GANGRENE BY THE INTRAVENOUS INJECTION OF HYPOCHLOROUS ACID.

FRASER and BATES (*British Medical Journal,* Aug. 5, 1916) report briefly 78 cases. Four cases in which there was evidence of serious toxemia ultimately recovered following the administration of hypochlorous acid, while two other cases died. In one there was immediate very definite improvement following the treatment. The reading of these cases carries no wide information.

PRELIMINARY HEMOSTASIS IN GOITRE OPERATIONS.

DE QUERVAIN (*Surgery, Gynecology and Obstetrics,* October, 1916) notes that the thyroid gland is enveloped in a thick layer of its own fibrous tissue, called the capsula propria. Outside this there is a space containing fine layers of connective tissue and veins called the thyroid space. In front it is bounded by a layer of fascia, viz., the inner fascia of the sternohyoid muscle, which, more laterally, forms the median boundary of the blood-vessel sheath. This is called the thyroid fascia and corresponds to what is generally named the external capsule. More posteriorly this fascia separates into single lamellæ which take their way to the trachea, the esophagus, and the spinal column. Around the thyroid fascia we find another space containing muscles, viz., the sternothyroideus, the sternohyoideus, and a portion of the omohyoideus, which is called the sternohyoid space. The outer wall consists of a strong fascia, viz., the outer fascial covering of the sternohyoid muscle. As such it overlays the thyroid region stretching from there to the rear. At the outer side of this space we have the space containing the sternomastoid muscle.

The chief component of the median wall is the thyroid fascia, its anterior wall being formed by the thyrohyoid. Behind the blood-vessel sheath the inferior thyroid artery takes its upward course, penetrating the posterior portion of the thyroid fascia on the median side of the carotid artery.

The parathyroids and the recurrents—the latter within the field of operation—are both situated in the spatium thyreoideum, for which reason, and because it contains numerous capsular veins, the thyroid space is avoided. Therefore we have at our disposal only the sternomastoid space. The operator frees the median border of the sternomastoid muscle and then penetrates between it and the fascia of the sternohyoideus. The jugular vein is always reached first and is liable to injury. Hence the author prefers the following course:

Kocher's collar incision is made, dividing at one sweep the skin, subcutaneous fat, and platysma myoides. The median border of the sternocleidomastoideus is drawn far outward with a blunt retractor so that the surface of the anterior fascia of the small muscles becomes visible. A vertical slit of about 2.5 to 3 cm. long is then made in the latter fascia, which is pared back bluntly and caught with a retractor. The finger then works deeply, in a median direction, along the median side of the common carotid. This vessel being released from its median surroundings the finger comes almost directly into touch with the inferior thyroid artery, which passes at a right angle to and underneath the carotid artery in a median direction. The artery is then lifted and ligated. As a rule no vein is encountered, excepting those on the surface. Sometimes the middle thyroid crosses the inferior artery. Ligation is rarely needful. Thereafter the required intervention may be practiced on the goitre itself. In a few cases the ligature of the thyroid artery was impossible owing to its too deep situation. In only one case of 276 ligatures was there permanent paralysis of recurrent nerve, and that not in consequence of the ligature, but of the shelling out of a cyst, between which and the posterior capsule firm adhesions had to be severed. In eight cases there was paresis incident to stretching the nerve during the process of luxating the goitre. This ligature also preserves the blood supply of the parathyroids. The superior thyroid can be ligated at a level with the thyroid cartilage. Ligation is only efficacious in cases of diffuse and especially of extremely vascular goitres, and even then is not to be completely depended on. Indeed, only small diffuse goitres recede sufficiently.

TREATMENT OF FRACTURES BY NAIL EXTENSION.

DYAS (*Surgery, Gynecology and Obstetrics,* October, 1916) holds that the introduction of the point of a needle is of great importance. It should be driven through healthy tissue not infiltrated with blood, and a portion of the bone should be utilized which will not invade the medullary cavity. A situation close to the epiphyseal line is ideal except in the case of children and young adults, in whom epiphyseal ossification is incomplete. The joint capsule must be avoided. A small tenotomy incision is made down to the bone and the needle is hammered through, counter-pressure being made on the other side of the bone by a wooden block covered with sterile linen. When the point breaks the skin is freed by a small cut. Collodion dressing is put upon each wound.

The chief use of the nail is in the lower extremity. The optimum time for continued extension is eighteen to twenty-one days, though the needle may remain *in situ* for a considerably longer period. The author concludes as follows:

It is less dangerous than the radical open operation.

It enables the surgeon to exert the maximum amount of traction while using the minimum area for the attachment of the traction apparatus.

It will bring about a reduction of the deformity in old cases in which other methods fail.

The technique is not difficult and can be mastered by any one. Therefore the method is practical and can be used by the entire profession.

It gives access to wounds in compound fractures, permits of frequent dressings, and does away with unclean, infected fixation apparatus.

The disadvantages are apparent brutality

of the procedure. This is not real, however, as the patients suffer no more by this traction than by any other method.

Danger of infection is less than the danger of an open, radical operation.

Hemorrhage may occur, but can always be readily controlled by enlarging the incision and tying off the bleeding point.

CÆSARIAN SECTION.

JOHN COOKE HIRST (*American Journal of Obstetrics*, November, 1916) states that the old classical operation, with long incision and delivery of the uterus, is the easiest and hence the best for the occasional or inexperienced operator. It has certain grave disadvantages: (1) The greater likelihood of hernia, in the very long wound. (2) The greater chance of adhesion of the uterine wound to the abdominal. (3) The greater chance of contamination of the peritoneal cavity, especially after the uterus is emptied and while the uterine wound is being closed.

It is one of the methods to be considered in a clean case, but is not a safe method in a case in which contamination is suspected due to repeated examinations or futile attempts at delivery.

The patient's skin is prepared as for any abdominal operation, and in addition the vagina is cleansed and packed with sterile gauze.

As soon as the operation is begun, the patient receives, by hypodermic, two ampoules of aseptic ergot, and one ampoule of pituitrin.

A long incision is made, extending from half-way between the umbilicus and xyphoid to near the symphysis, and the uterus delivered outside the abdominal cavity.

Large gauze pads, with tapes attached, are packed behind, to either side, and in front of the uterus, to safeguard the peritoneal cavity from contamination.

An assistant, with both hands outspread, compresses the abdominal wall around the lower uterine segment. This is not to control hemorrhage, but to prevent blood and liquor amnii entering the peritoneal cavity. To compress the broad ligament to control bleeding is a mistake, as it tends to favor subsequent relaxation.

The uterus is incised in the middle line, anteriorly. The placenta, if exposed by the incision, is disregarded. The child is seized by one leg and delivered. The cord is clamped in two places and cut, the child being held meanwhile head downward. The child is then handed to an assistant, to be revived, if needed, and the cord tied.

The placenta is delivered manually, and the membranes freed by gentle traction.

The first layer of sutures is begun by inserting a curved needle threaded with a long strand No. 2 chromic catgut, through the uterine wall above the wound and emerging in the upper angle of the wound, just above the endometrium. The cut muscle is then closed in two layers, by a continuous tier stitch, care being taken not to penetrate the endometrium. When the upper angle of the wound is reached, in the return, the needle penetrates the wall and emerges above the wound, opposite the point of insertion; the stitch is then tied. Thus no knot is buried in the wound.

The peritoneal covering of the uterus is closed by a continuous stitch of No. 2 chromic catgut, threaded on a straight needle, sewing from above downward, and on returning the needle is inserted between the insertions made on the downward trip. This stitch also is tied above the uterine wound, the complete stitch appearing like a laced-up shoe.

The uterus is returned to the abdominal cavity; any clots are sponged out of the peritoneum (usually only a small amount, if any, near the bladder), and the abdominal wound closed and dressed in the ordinary way.

The Saenger operation, with short high incision, has the very great advantage of preventing the coincidence of the uterine and abdominal wounds, and therefore minimizing the dangers of adhesions. The short wound is much less likely to be the site of a hernia. It is slightly more difficult than the old classical operation. The only contraindication to it in a clean case would

be a case of placenta previa where it was vital to prevent all possible loss of blood during the operation, as here the broad ligament cannot be compressed while the uterus is being opened as in the case of the long incision. Otherwise it is by all odds the best operation for the clean case.

The patient's abdomen and vagina are prepared as previously described, and the same dose of ergot and pituitrin is given when the operation is begun.

A short central incision is made, one-third above and two-thirds below the umbilicus, just long enough to permit the delivery of the head.

An assistant compresses the abdominal walls around the uterus, *in situ*, making greater pressure from the patient's right toward her left side. This is to overcome the normal lateral torsion of the uterus; if it is not done, the uterine incision will be too near the left broad ligament, with considerably more hemorrhage.

The uterus is incised and the child delivered and treated as previously described.

As the head is being delivered, the assistant hooks his forefinger in the upper angle of the uterine wound, and pulls the uterus out of the abdomen, and then packs off with gauze behind and to either side.

The placenta and membranes are then delivered as previously described.

The uterine wound is closed exactly as in the previous operation, the uterus returned to the peritoneal cavity, and all clots sponged out.

The abdominal wound is closed and dressed as usual.

The ideal indication for the extraperitoneal Cæsarian section operation is the case which has been in labor for a considerable time, whose lower uterine segment is therefore well thinned out; who has been repeatedly examined; whose child is in good condition, but who is not obviously infected; one whose previous aseptic management is open to suspicion, but not one whose infection is a practical certainty.

It has certain disadvantages: (1) It is the most difficult, technically, of all the Cæsarians. (2) It is not to be attempted before the patient is in labor, as the lower uterine segment is not thinned out. (3) Above all, it is not the operation for placenta previa; this because of the excessive bleeding.

These objections apply more or less to all the methods of extraperitoneal Cæsarian, but particularly to the one whose technique is here described.

The patient's abdomen and vaginal canal are prepared as previously described, and the doses of ergot and pituitrin given.

A central incision is made, from 2 inches below the umbilicus to the symphysis.

The peritoneum of the lower uterine segment is split in the middle line and dissected down behind the bladder.

The parietal and visceral layers of peritoneum are then clamped or sewed together. The former is quicker, easier, and satisfactory. This leaves an oval space of raw uterine muscle exposed.

A broad-bladed retractor is then placed behind the bladder in the lower angle of the wound.

The lower uterine segment is opened in the middle line, and the child's head delivered through the wound, with forceps. During the delivery of the head the retractor is removed, as its presence increases the risk of a tear of the bladder. A breech presentation makes this step of the operation considerably easier.

The child is treated as in the previous operations.

The placenta is extracted manually, with its membranes.

The wound in the lower uterine segment is then closed with a two-tier continuous stitch No. 2 chromic catgut. This stitch is a little more difficult of insertion than in the previous operations, but the difficulty is fairly easy to overcome.

The hemostats or stitches holding the two layers of peritoneum together are removed, and the peritoneum of the lower uterine segment sewed back where it belongs, over the uterine wound. No. 2 chromic gut is used.

The peritoneum is cleansed, and the abdominal wound closed as usual.

Due to the suture line in the lower uterine segment, which prevents it from collapsing as it does after normal labor, the fundus for a few days after labor is held up rather high. This is only for a short time, and the rate of involution proceeds normally thereafter. The uterine and abdominal wounds coincide for a small part of their extent only, and adhesions are unlikely.

During the whole operation none of the abdominal organs except the uterus are visible, and the smoothness of the convalescence of these cases will surprise one who sees it for the first time. It is like that of a normal labor case. The field of the operation is limited, but in its field it is a very useful procedure.

The bleeding during the operation is usually no more than after a normal labor. If it seems excessive, it should be remembered that the greatest possible irritation of the uterine muscle is the insertion of the necessary sutures. The suturing should therefore be begun without delay. In emergency, the bleeding can be controlled by compression of the broad ligaments, but this is rarely needed.

Postpartum hemorrhage is not greatly to be feared; the only cases in the series on which these conclusions are based were three in which no hypodermics or ergot were used. In all three of these the bleeding was controlled by uterine packing. Hirst does not hesitate to pack or irrigate a uterus sewed up as described.

Infection is the most serious complication, as it nearly always takes the form of peritonitis. The danger can be minimized by careful selection of the type of operation performed, and should peritonitis develop, the Fowler position, stimulation, and drainage are our only means of combating it.

It is not uncommon to see considerable abdominal distention after a Cæsarian section. Peristalsis is active, but the condition requires energetic treatment, not so much on account of any danger, but of the extreme discomfort: Hypodermic of eserine salicylate gr. 1/40, strychnine sulph. gr. 1/30 every four hours; hypodermic of ½ ampoule of pituitrin twice daily; high enema of alum oz. 1 to the quart; the rectal tube left in place several hours at a time; and, if there is much gastric tympany, lavage. This routine will correct the trouble within forty-eight hours as a rule.

Especially in primiparæ there may be a rise of temperature to 102° or over about the fourth or fifth day, accompanied by some foul odor to the lochia. This is due to a lack of vaginal drainage, and usually not to any retention of clots in the uterus. A daily vaginal douche of sterile water is all that is required. Hirst states that he would not hesitate to irrigate the uterus in these cases, if it should be required, but it is very rarely necessary.

Stimulation is given, when needed, by hypodermics of digitalin gr. 1/10, strychnine sulph. gr. 1/20, camphorated oil in emergencies, but not intravenous injection of salt solution unless the need for stimulation has been caused by loss of blood. Simple postoperative shock will react better without the intravenous.

In cases of elective operation, the abdominal skin is as carefully prepared as for any other section. Most of the cases are emergencies, however, and a satisfactory skin preparation is to thoroughly shave, and then cover the abdominal skin with a thick poultice of tincture of green soap, held on by a binder. This is left on until the patient is on the table, then removed, and the skin further cleansed with alcohol and covered with rubber dam, through which latter the skin incision is made. The dam answers the same purpose as the surgeon's gloves. If one skin is covered, why leave the other exposed?

The anesthetic should not be gas. Ether or chloroform is preferable. The gas is dangerous to the child. The operation can be done under local anesthesia, but this is undesirable. So little time is needed for the operation that the short anesthetic period is without risk.

It is always advisable to have a trained assistant to conduct the revival of the baby. These babies often show the effects of the anesthetic to the mother and require considerable attention. Particularly is this

true when previous attempts at delivery have been made, with extra periods of anesthesia and possible injury to the child. It is common to see these babies born in asphyxia livida, and they require careful handling. The operation by no means guarantees safety for the child, when all these factors are taken into consideration.

The conclusions reached are based upon the writer's personal experience of 118 operations with three maternal deaths, a mortality of 2.54 per cent. The series is consecutive and unselected, all done by one of the methods detailed above. One mother died of peritonitis, due to infection probably at the time of operation; one of peritonitis, due to premature absorption of catgut and leakage from the uterine wound; and one from hemorrhage, not uterine in origin, but from a ruptured varicose vein in the broad ligament. This was proven by reopening the wound after death. The author's records of the child mortality are unfortunately not complete. He has the records of fourteen, and it must be remembered that in many of these patients previous and often violent methods of delivery had been attempted. Cæsarian section done as a last resort after attempts at delivery will always be attended by a fairly high fetal mortality, but for the mother is infinitely better than violent delivery not only in its immediate dangers, but in its effect upon the mother's future health.

A STUDY OF THE MENOPAUSE.

CULBERTSON (*Surgery, Gynecology and Obstetrics,* December, 1916) concludes his article as follows:

The menopause is a functional derangement on the part of various glands of the endocrine system subsequent to the cessation of the ovarian secretion.

On this basis may be explained the psychic and somatic manifestations of the menopause.

The vasomotor disturbances represent an instability of arterial tension.

In the majority of cases this takes the form of a vacillating hypertension, both systolic and diastolic.

The diastolic pressure is not elevated proportionately to the systolic. This produces an increased pulse-pressure.

Hot flushes, sweating, and other vasomotor symptoms are directly created by the vacillations in arterial tension.

In a minority of cases there is arterial hypotension, and here also the systolic and diastolic pressures are out of proportion.

Hypertension is apparently due to a relative oversufficiency on the part of the hypophysis or the adrenals.

The psychic symptoms are apparently influenced by thyroid dysfunction—in the majority of cases a hyperthyroidism, in the minority a hypothyroidism.

The administration of the missing hormone, represented by the extract of corpora lutea from animals in early gestation, brings about a gradual restoration to normal of the blood-pressure with disappearance of the mental symptoms.

This reduction of blood-pressure by organotherapy, together with the disproportionate systolic and diastolic rise, is offered as evidence that the hypertension is a functional one and not due to organic changes.

Blood-pressure estimation is essential, as a means both of measuring the degree of menopause disturbance and of controlling its therapy.

An occasional pressure reading is of little or no value. Tension must be determined at frequent intervals, preferably daily until improvement is well under way.

The significance of functional hypertension as a factor in uterine hemorrhage is obvious and will be made the subject of a subsequent report.

SOME PHASES OF EXPERIMENTAL SYPHILIS.

REASONER (*Journal of the American Medical Association,* Dec. 16, 1916) concludes an experiment on this subject as follows:

We have been able to demonstrate, to our satisfaction, fixed differences in various strains of syphilis as studied in the rabbit. In order to demonstrate these differences,

the use of adult rabbit and a standard and proper method of inoculation are necessary.

Choroiditis and chorioretinitis have been observed in rabbits inoculated with two different strains of nervous syphilis, and one strain whose characteristics are not known. In a series of fourteen other strains obtained from chancres and mucous lesions and studied with this end in view, such lesions were not observed.

Interstitial keratitis and pericorneal injection are frequent manifestations of generalization in some of various strains observed. In some it seems to be deeper and more permanent than in others. It is more readily induced by repeated intravenous injections following the testicular lesion, if performed within two months of the testicular lesion. The organisms may be demonstrated in the corneal scrapings. This is suggestive of a definite secondary stage.

Ordinarily the rabbit develops only an initial lesion, following inoculation in the genitalia, eyes, and eyebrows. Generalized syphilis without an initial lesion follows intravenous injections into various tissues and subcutaneous inoculations. This is suggested as having a possible bearing in the human disease. It would seem probable that the initial lesion, both in the human being and the rabbit, is an attempt at defense on the part of the individual, and that this power of reaction is possessed only in yarying degree by certain tissues.

Reasoner is inclined to agree with Noguchi that the nervous tissue of the rabbit is resistant to syphilitic infection.

He was able to show that it was possible to produce nervous involvement in the rabbit without actual intracranial inoculation. He also succeeded in confirming Noguchi's sensitization experiments.

It was possible to demonstrate a generalized infection in rabbits from which the inoculated testicle had been removed before the initial lesion had fully developed. In one case the disease was transmitted by means of the blood serum of a rabbit, seventeen days before the initial lesion was palpable.

Nichols demonstrated that, in one strain at least, the removal of the inoculated testicle, as soon as the lesion was manifest, tended to favor the development of a lesion in the uninoculated testicle.

In his experiments, heating for five minutes at 50° C. killed the organisms. In a richly infected testicle kept at room temperature for fifty-six hours, it was possible to demonstrate slight rotary motion of the organism.

Two different strains were successfully inoculated into different testicles of the same rabbit on the same date. After a certain period superinoculations are difficult to produce.

The interpretation of the lesions and manifestations of strains of syphilis in the rabbit so as to increase our knowledge of human syphilis requires the coincident study of the same and similar strains in the human being.

He has seen in the rabbit a peculiar late testicular manifestation following repeated injections, intravenous and otherwise. It shows itself as a small nodule in the testicle, and contains many very slender and elongated organisms with normal forms. When transferred, the normal type of organism appears.

From eight injections of human spinal fluid, only two successful inoculations were obtained.

He has not been able to discover any morphologic differences in the various strains studied.

No permanent alteration in the characteristics of the strains has been observed following prolonged growth and repeated transfers in the rabbit.

Granting that there are strains or types of syphilis, differing in invasiveness or predilection for certain tissues, and having in mind more especially the nervous tissues, the individual resistance of the infected person must still be considered as a possible factor in the development of the disease.

A general anesthetic was employed in all operations or procedures which might be accompanied by serious pain or discomfort to the animal, and the few animals which developed a paralysis or other untoward manifestations were promptly and painlessly killed.

REVIEWS.

A Manual of Pharmacology. By Torald Sollman, M.D. W. B. Saunders Company, Philadelphia, 1917. Price $4.50.

All English-speaking pharmacologists are probably familiar, or ought to be familiar, with the earlier publications of Dr. Sollman. He has seen fit, with his publisher, not to consider this volume a later edition of his original text-book on pharmacology, but rather that it is a new work; since extensive revision of certain parts and exclusion of other parts has very materially changed the contents of the book. In order to keep the volume within bounds (at present it amounts to over nine hundred pages), he has separated the directions as to laboratory experiments and investigation and published them in a smaller companion volume. With the same object in view a large amount of the present volume is put in small type, the intention being that the facts stated in large type shall be considered the major ones, while those in the small type shall be considered of minor importance and only given consideration by those who wish more complete information along particular lines. Such a division of matter is by no means an easy task, and the practicing physician will, in a goodly number of cases, find that some of the facts which are most important to him are in the smaller type, or not mentioned at all, whereas the purely pharmacological facts are given *in extenso*. This is as it should be in a book which is entitled "A Manual of Pharmacology." A copious bibliographical index is added at the end of the volume, instead of at the end of each chapter, as in the earlier editions of the work.

It is impossible to take up *in extenso* all the characteristics of this noteworthy volume. Dr. Sollman has brought to its preparation a large amount of scientific knowledge and accurate observation from the laboratory standpoint, and has provided physicians with a mine from which they can continually take valuable information. He has not given as much credit or quoted as often from the earlier investigations by American pharmacologists as he should have done, the vast majority of his references being to foreign literature over many decades, or to the work of Americans within the last five or ten years. Nothing is said about the work which was done by Horatio C. Wood and others, three or four decades ago, although some of these investigations were noteworthy, as, for example, the work of Wood and Reichert on the physiological action of the coal-tar products upon the heat mechanism, nor the investigations of these men upon chloroform and apomorphine.

The difficulty in classifying drugs has, as a rule, been well met, but in certain instances this difficulty is well illustrated. Thus, we find that under Fermentatives and Nutrients cod-liver oil is considered, but olive oil, lard, and similar animal fats are considered under Emollients, although they might be equally well considered under Nutrients, the more so as olive oil is often used by physicians to cause the patient to gain weight. We are also interested to note that ergot is not placed in any class, but immediately following it there is a class of drug classified as "Ecbolics" or "Oxytoxics." Surely ergot is essentially the oxytoxic, and, if a classification is to be adhered to, pituitary extract ought to be included under this heading, instead of being widely separated from it under a heading of its own.

There are a number of minor errors to which attention might be called, as, for example, the statement that a cup of tea or a cup of coffee contains an equal amount of caffeine; or that a cup of coffee contains the equivalent of one and a half grains. The U. S. government has shown that it contains about two and a quarter grains, and a cup of tea about one and a half grains. It is not clear why there should be an article on Anaphylaxis between Viburnum and the Nitrites. The statement that the action of the coal-tar antipyretics is such as to prevent the temperature from falling below the normal level is certainly not in accord with

clinical observation. So, too, we think that the statement that twenty grains of antipyrin is the average dose is erroneous, and that the advice that four or five doses are required per day to keep the patient practically fever-free will lead the physician into difficulties. Unless most of those who have employed hydrotherapy to a large extent in the treatment of fever are entirely in error, the observation made in regard to cold baths and the use of antipyretic drugs is not in accord with clinical experience, and the statement in italics that "the best general treatment of fever consists in a combination of antipyretics and graduated baths" will, if we mistake not, call forth a protest by that apostle of cold bathing, Dr. Simon Baruch. The object in using a cold bath is not to reduce the temperature but to eliminate poisons and stimulate protective processes, the return of temperature being a matter of comparatively little importance unless there is hyperpyrexia. The simultaneous use of coal-tar products prevents reaction and interferes with the benefits that the cold bath produces. The statement that quinine is absorbed mainly through the small intestine is also contradictory to the views commonly held by physicians, who generally believe that it is precipitated in the intestine, and that in urgent cases it is to be given in an acidulated solution in order to be promptly absorbed through the stomach.

These points are noted because in these respects the book will not serve as a practical guide to the clinician, but they would not be made were it not that the rest of the volume, in its pharmacologic aspect, is so great a credit to the author and to American medicine. One cannot peruse its pages without being impressed with the immense amount of literary research which the author must have carried out to bring together all the facts that he gives us. No pharmacologist can consider his library complete without this book. It is one to which we shall always turn when we desire information in regard to many fundamental facts in connection with the action of drugs as they have been determined in the laboratory.

A Laboratory Guide in Pharmacology. By Torald Sollman, M.D. W. B. Saunders Company, Philadelphia, 1917. Price $2.50.

In calling attention to what is practically the new edition of Dr. Sollman's Text-book upon Pharmacology we noted the fact that, in order to add certain material to the main volume, he had abstracted therefrom a large amount of information in regard to laboratory exercises and methods of experimentation. This smaller volume, containing three hundred and fifty-five pages, is designed, as its title indicates, to introduce the student personally to some of the more important facts of pharmacology. In Part I Pharmacology and Toxicology exercises are confined strictly to the bare essentials which the author thinks are needed by the students who intend to become general practitioners of medicine. In Part II Experiments on Animals have been arranged in groups to illustrate the various types or phenomena and to bring out the similarity or difference in the response of organs to pharmaceutical agents rather than by individual drugs. Exercises are arranged for a course of thirty working periods of from two to three hours, but longer courses are also introduced.

Altogether the volume contains forty-six chapters, and to a certain extent duplicates some of the material which is found in the main volume, as, for example, the discussion of the treatment of poisoning and convulsants, the treatment of circulatory collapse, and in Chapter 46 the treatment of acute cardiac lesions. References are given in large number to technical papers to which the student may resort for collateral reading.

This volume, like the main one, reveals an immense amount of research in pharmacological literature, great familiarity with the technical portions of experimental pharmacology, and it is probably the best book in English to be obtained as a laboratory guide in the subject of which it treats. The type is large, the printing is well done, and the binding is of a quality to stand hard usage.

THE PRACTICAL MEDICINE SERIES. Under the General Editorial Charge of Charles L. Mix, A.M., M.D. Volume 10. Nervous and Mental Diseases, Edited by Hugh T. Patrick, M.D., and Peter Bassoe, M.D. With the Collaboration of Lewis J. Pollock, M.D. Series 1916. Price $1.35.

As our readers probably know, this series appears in ten small volumes a year dealing with the different branches of medicine, and, as indicated in the title, this is the tenth volume for the year 1916. It consists in abstracts from current medical literature by the chief editor and his assistants, and covers to a large extent the important neurological literature of the past twelve months. The influence of the European war upon the publication of neurological papers is well shown by the few references to foreign journals which the authors are able to make. Dr. Patrick is so well known to neurologists as one of the foremost men in his field that confidence may be felt in his separating the wheat from the tares in such a compilation.

THE MEDICAL CLINICS OF CHICAGO. January, 1917. Volume 2, No. 4. W. B. Saunders Company, Philadelphia, 1917.

We have so frequently called attention to the Medical Clinics of Chicago that there is little to be said in regard to their general intent and purpose. The present issue contains twelve clinics, by different hospital physicians in the city of Chicago, which are reports of what they said when giving bedside instructions in their various institutions. The book is well printed and illustrated whenever necessary.

THE PRACTICAL MEDICINE SERIES. Under the General Editorial Charge of Charles L. Mix, A.M., M.D. Volume VII, Obstetrics. Edited by Joseph B. De Lee, A.M., M.D., with the Collaboration of Herbert M. Stowe, M.D. Series 1916. The Year Book Publishers, Chicago.

This book, representing a year's progress in Obstetrics, covers Pregnancy, Labor, Puerperium, the New Born, and Obstetrics in General. The selection of articles is excellently done, and the book is a most useful résumé of the more important literature.

CORRESPONDENCE.

LONDON LETTER.

BY J. CHARLTON BRISCOE, M.D.

For the last twenty years we have been accustomed to look forward to mild winters. The last severe winter which we experienced was that of 1894-95, when for the greater part of the months January, February, and March the country was frozen, and skating was continuously possible. Since then, at all events in the southern part of the country, winters have been so mild that ice has not persisted for more than a few days. This year, however, we have had a spell of cold weather for three of the four weeks in January, and there is every prospect of it continuing. Very little snow has fallen, and there has been no occasion to scrape it from the pavements. The wind has been sufficient in most cases to clear it away without leaving any trace. A good fall of snow would be a considerable benefit, as owing to the hard ground the birds are driven to picking the autumn-sown corn which has just come through the ground, and by this means do considerable damage to the prospective crops, so that the country folk are hoping for a fall of snow, whereas the town people are not particularly anxious for it.

We have again to report that cases are not being brought over in large numbers from the military areas. I have had to deal with a few cases of trench foot, but these are very mild as compared with those of 1914, owing to the possibility of more careful observation at the front, so that none of them have shown any signs of gangrene. With six weeks in bed and other treatment they are able to get up and commence getting about. Six weeks seems to be about the minimum time for these cases to lose their pains and vascular symptoms. Beyond this type, the remainder of the cases seem to

be ordinary ailments, such as rheumatism, coughs, bronchitis, etc.

The scheme which I have frequently referred to for the treatment of venereal diseases came into force on January 1. It will, of course, be some time before the full advantages of the scheme are realized by the general public and by general practitioners, so that at the opening clinics there were not a great number of cases. The greatest rush is expected to take place with demobilization, and it looks as if the scheme will be some little time in operation before this eventuates.

Whispers are heard of another considerable call up of medical men, and the local committees are drawing up lists detailing the order in which different individuals ought to be summoned to the R. A. M. C. From conversations with men from different parts of the country, it appears to be the general opinion that a reorganization of staffs of the hospitals is practicable. In London the hospital staffs are dealt with through an Advisory Board constituted from the Royal Colleges of Physicians and Surgeons, and they have been busy going through their lists to see who can be spared. Possibly more organization could be carried out in London in the direction of the rearrangement of work. We find that a surgeon may be attached to several smaller district hospitals which are widely separated from one another. The same surgeon may be attached, for instance, to a hospital in southwest London and to another in northeast London. By reorganizing the staffs of these hospitals it would certainly be possible to curtail the traveling incident to the present arrangement. This is especially desirable, as the difficulty of obtaining chauffeurs is increasing markedly. The government have been considerate with regard to the question of calling up chauffeurs, especially those of medical men, and every effort is being made to supply chauffeurs from amongst those who are not fit for general service, and also from women who have obtained their certificates for motoring. The difficulty lies in the hours, for the substitutes are necessarily not so strong as the ordinary chauffeur, and cannot stand the increased work caused by night practice.

The difficulty alluded to above in supplying chauffeurs is voiced in the complaint of the Committee of the Metropolitan Asylums Board, who fear that in a short time they will be depleted of their drivers, and will be unable to send ambulances to remove infectious cases. Further, the removal of such a number of mechanics from the motor ambulance stations will prevent the necessary repairs to the motor vehicles from being carried out. A complaint has been made and laid before the Local Government Board and passed on to the military authorities. As a result an effort is to be made to obtain mechanics who are ineligible for military service. Early in this month 37 per cent of the ambulances used in these services were in need of repairs.

The recent explosion in an important munition works was felt at great distances. Houses were shaken and windows broken at a distance of at least six miles. In the open places the explosion was not felt. At the time it occurred I happened to be in Oxford Street. There was a sudden glow of reddish hue in the sky to the east, to which a second and more intense glow was added. Just as the second lighting up was dying away, the explosion was heard, and sounded very much like the firing of an anti-aircraft gun at a distance of a quarter of a mile. There was no alarm, and nobody seemed to appreciate what had happened, the general idea being that a cinema theater had caught fire somewhere much nearer to the center of the town than the site of the explosion.

NOTES AND QUERIES.

THE TIME FACTOR AND PREPAREDNESS.

The *Military Surgeon* for February, 1917, reminds us that General Forrest, of the Confederacy, epitomized the art of war in his saying that military success depended on "getting there first with the most men." He did not speak of "getting there some time, or any time"—he said "first."

All through the present war we have seen, over and over again, the truth of Forrest's saying borne out by results. Certain nations have been "getting there," but always too late to secure commensurate success. They have been tardily getting ready for military action at a time when the military situation demanded the action itself, and, therefore, have had to lose the tremendous military advantage of being able to take the offensive. Ultimately and belatedly they have gone through all the tremendous preparations necessary, shouldered the vastly increased cost of the same, and made an unduly bloody sacrifice of men and lives—all because the time factor had been previously overlooked, or disregarded, in their calculations. When they finally aroused to a realization of its vital importance, the critical period had passed by and the opponent, operating through a shorter time factor, had secured, and used to the fullest, the advantage of men and position.

The American people seem strangely to have overlooked the almost paramount value of time, in respect to the success of military operations. They have apparently learned nothing in this regard from the European war. They seemingly have not grasped the great truth, that initial success may be the deciding factor in the campaign or war, and that such initial success depends directly on the degree of preparedness. In other words, on ability to use a shorter time factor than the opponent—"to get there first with the most men."

They seem to treat time as a negligible quantity, and are prodigal of this factor, though it be recognized by all military men as of basic importance in war. They apparently are willing to accept all the increased burdens and cost of delay, and to sacrifice armies in later securing positions of tactical advantage that, with preparedness, might have been occupied without resistance. Every conception of such military plan as is generally advanced seems to contemplate the beginning of training and preparation after hostilities are declared and blows are struck.

In all the newspaper comment on the war, the *Military Surgeon* has never noticed a single item referring to the time factor. Apparently the country assumes that, in some way or other, it will ultimately muddle through its difficulty. While proud of its potential resources, the nation blinds its eyes to the fact that these are not immediate military assets and assumes, without warrant, that the enemy will generously suspend military operations for the long time necessary to convert the former into the latter. As well might a peaceful citizen, assaulted by a footpad, expect immunity while he undergoes training in boxing, so that he may be able to defend himself.

This time concession and delay of hostilities are exactly what no intelligent and vigorous enemy would ever grant us. He would strike at once and strike hard, to paralyze at the outset the complex, cumbersome machinery of preparation we propose, tardily, to attempt to create and set in motion. He would wring every particle of advantage out of the time factor.

Had the call for the present mobilization come against a first-class power, the indemnity would doubtless have long since arrived at the foreign capital. Our latent resources, large though they may be, are no bulwark against the sudden, swift and mighty blows of modern warfare, any more than next year's crops would be of value in a present famine. This nation has no France, as England had, to raise a stone wall, behind which there is opportunity for the two years' intensive preparation demanded by modern war.

The Medical Department has not the

power to govern the general military policy of this country. But it sees, at least as clearly as any other branch of the service, the necessity for preparedness. Long in advance of the present mobilization on the border, it realized the value of the time factor. As a result there has been no complaint as to shortage of medical supplies, because they were procured and stored against the time of their need, and were ready when emergency required. It has contended, against opposition and inertia, for a personnel adequate to utilize its supplies in time of stress. It was training its medical reserve officers for years before any other branch of the service had such a supplementary force. It has been a leader in this, as in many other military affairs, and has set an example in forethought and preparation which has not been lost upon the rest of the army. So far as it is concerned, the emergency found it prepared to function in a quite satisfactorily short time factor.

But the success of the Medical Department, in its broader sense, cannot be dissociated from military success as a whole. This, for the future, depends upon preparedness, upon a short time factor, upon ability to "get there first with the most men."

There is absolutely no plan that will satisfy the nation's need in this respect other than that requiring universal military training. The issue cannot be evaded, and it is easy to see through the specious arguments created to becloud it. When any military emergency arises, it must find the men trained, the guns on hand, and the supplies in stock. To attempt to get along with less is for the nation to throw dice with destiny. The provision in advance of adequate military defence means that the rights of the country will not be assailed, and that it will mercifully be spared the necessity of utilizing the military agencies so provided. There need be no fear of aggression by any other nation, if there is a world knowledge that we are the ones who, as a result of forethought based on common sense, will "get there first with the most men."

FEES OF YOUNG PRACTITIONERS.

In an action by a physician against an estate for services rendered the testatrix for some disease of the brain, the nature of which even a post-mortem examination did not clearly determine, it appeared that the plaintiff was a young physician who had been an old friend of testatrix. The trial judge allowed the claim of $1500 only to the extent of $262, being of opinion that a young practitioner has no right to charge, or expect to be paid, the fees charged by those who are older and whose reputations have been established. On appeal, the Louisiana Supreme Court said that it may happen that the knowledge of the schools goes beyond that upon which reputations have been founded, and that the latest graduate, bringing, with his diploma, the latest discoveries, is more competent to deal with a particular case than the earlier, with the experience of a past generation. However that may be, the court held that any physician has the right, in the absence of a custom of his own, to charge for his visits, day or night, at least the fee sanctioned by the custom of the community in which he lives; nor is he obliged, in so doing, to rate himself below the class to which, in his opinion, he properly belongs; and in such a case the burden rests upon the patient who refuses to pay to show a better reason for such refusal than that the physician is comparatively fresh from the seats of learning. The amount to be allowed was increased to $1500, the amount claimed.—Succession of Percival (La.), 72 So., 467.—*Medical Record*, Nov. 25, 1916.